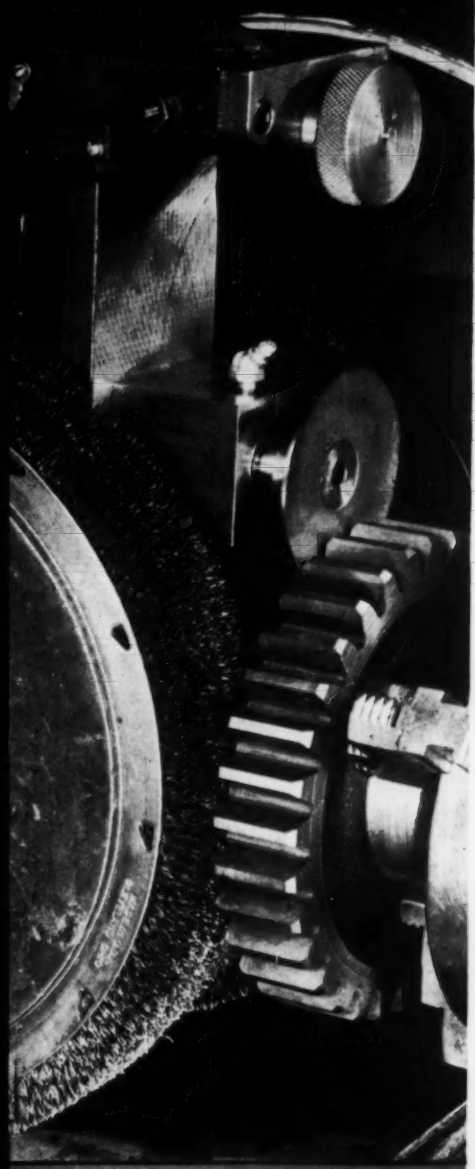
FEBRUARY 9, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Page 45 . . .

Components Prices Grow Firmer; Hikes Will Be Few and Small

Page 52 . . .

Incentives: Managers' Challenge

Page 54 . . .

Near-Record Profits on the Way

Page 88 . . .

Kaiser Sees 45 Million Tons of Oxygen Steel Capacity by 1965

Page 94 . . .

One Unit Cleans, Paints Parts

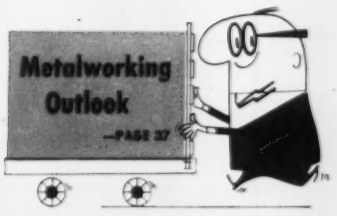
Page 108 . . .

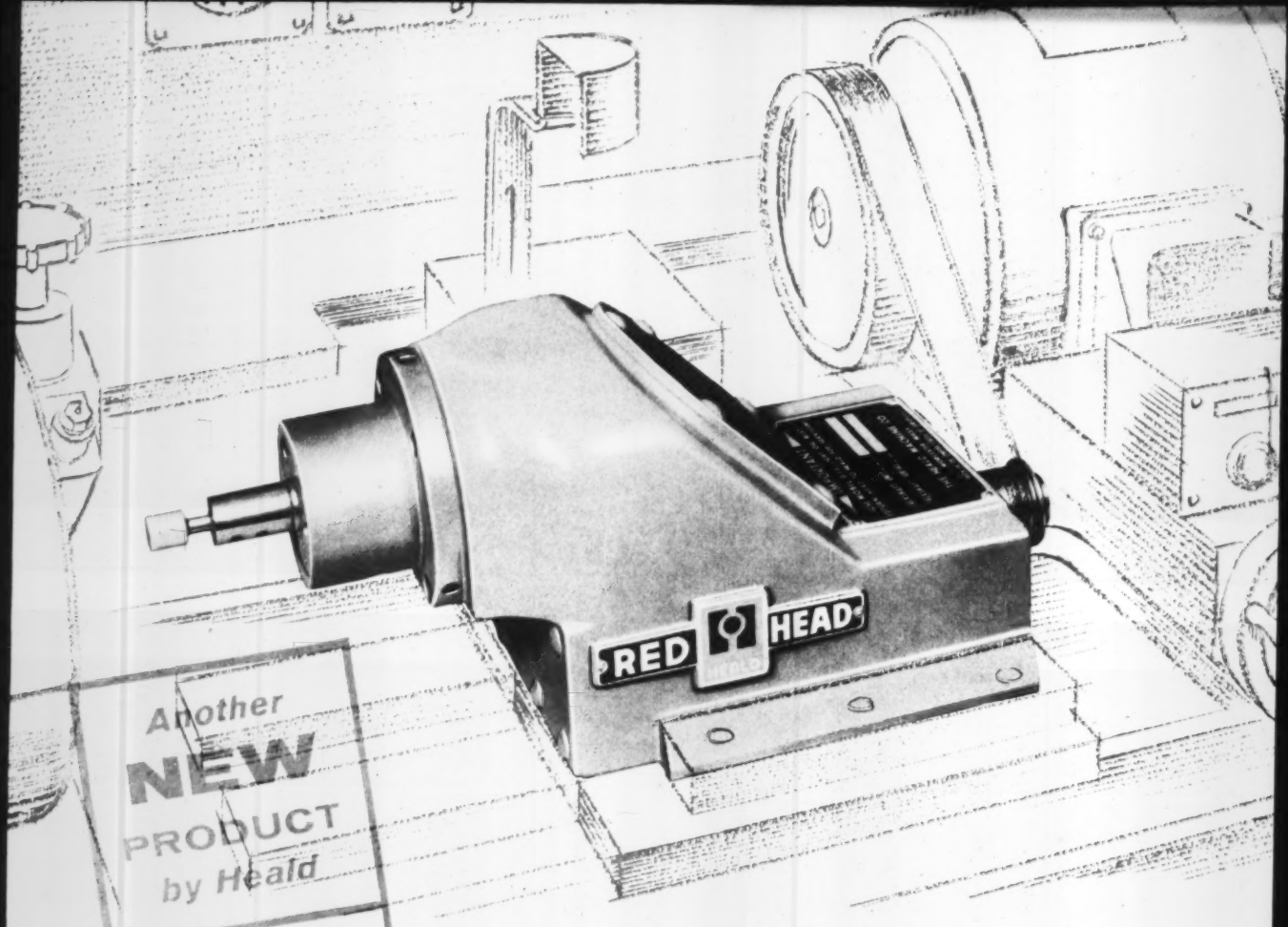
Why Sheet, Strip Mix Is Changing

How To Select Brushes

• They can be among the most important tools in your shop. Manufacturers are using them to blend edges, smooth surfaces, deburr parts, and remove scale. To learn what brushes can do for you and how to choose the right type, see . . . Page 80

CONTENTS — PAGE 5





Now—for the first time—

a HI-SPEED BELT-DRIVEN WHEELHEAD

for speeds to 100,000 rpm

THE NEW Heald Red Head Hi-Speed belt-driven wheelhead offers a practical, *low-cost solution* to the problem of getting proper wheel speeds for small hole work where high frequency generating equipment is not available. It provides speeds from 45,000 to 100,000 rpm with simple belt drive from a standard electric motor!

The basic wheelhead consists of a jackshaft and body unit and a spindle cartridge. Two easily interchangeable spindle cartridges are available — one for speeds of 45,000, 52,000 and 60,000 rpm; the other for 70,000, 85,000 and 100,000 rpm. The three speeds for each spindle cartridge are obtained simply by changing the drive pulley on the rear end of the jackshaft.

Built to the highest standards of accuracy and precision, this latest addition to the Heald Red Head line opens up a new area of internal grinding operation in the small hole class hitherto impossible without special equipment. Ask your Heald representative for complete information. Or send for a copy of Bulletin 6-3.

HEALD

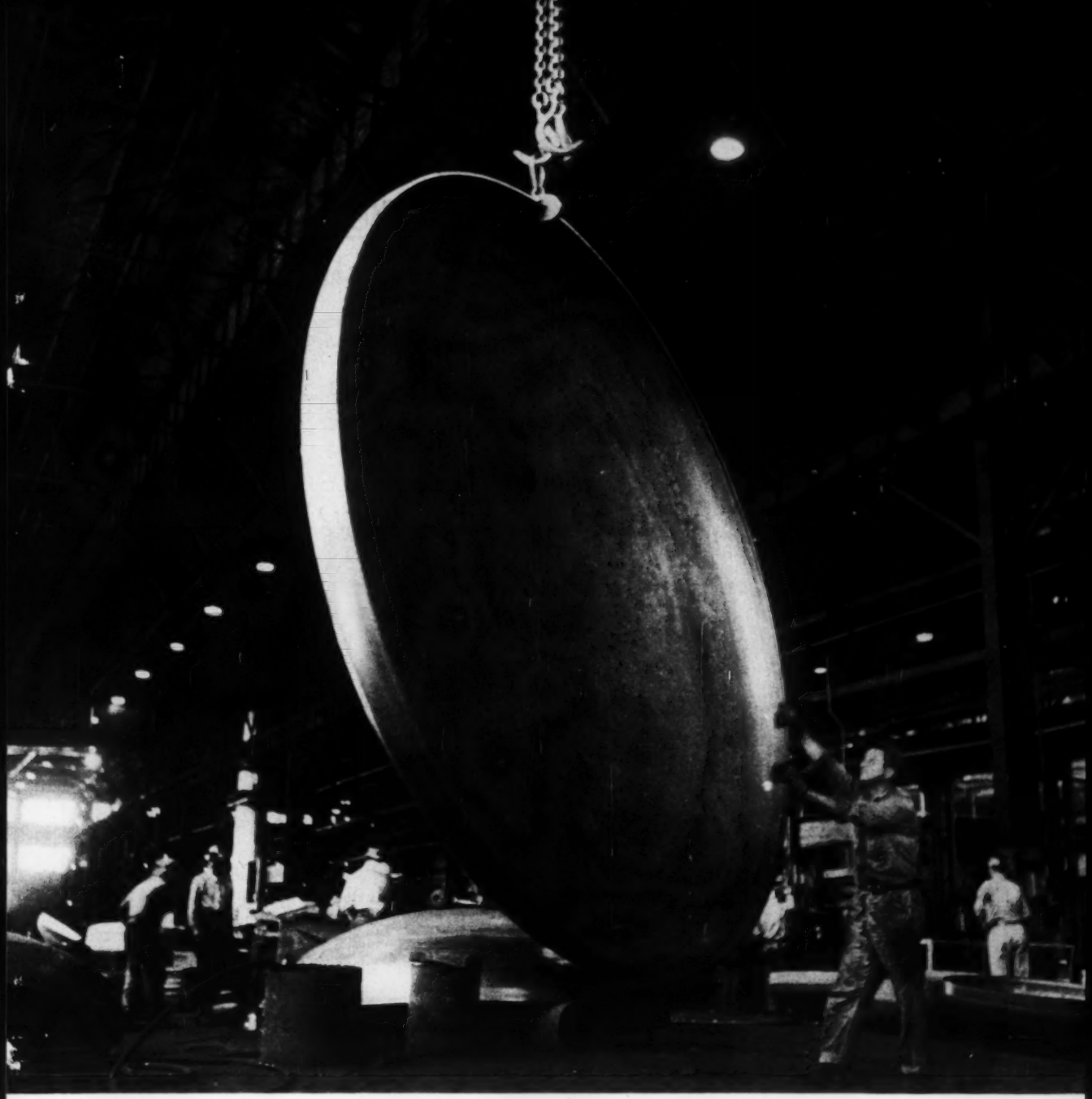
It PAYS to come to Heald

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



Call Bethlehem for Flanged and Dished Heads

Bethlehem makes flanged and dished heads to meet virtually every requirement. The types we produce include ASME Code, elliptical and standard flanged-and-dished. Also flanged-only, dished-only, shallow-dished, double-dished, and heads for special requirements.

Bethlehem heads come in diameters up to 144 in. They are made in thicknesses from 14 gage to 2½ in. Bethlehem also produces standard manhole and hand-hole saddles, covers and fittings, and also heads with flued openings.

A number of sizes of ASME Code flanged-and-dished heads are stocked for prompt delivery.

A letter or phone call to the nearest Bethlehem sales office will bring you a copy of our stock list. Or write to us direct at our offices at Bethlehem, Pa.

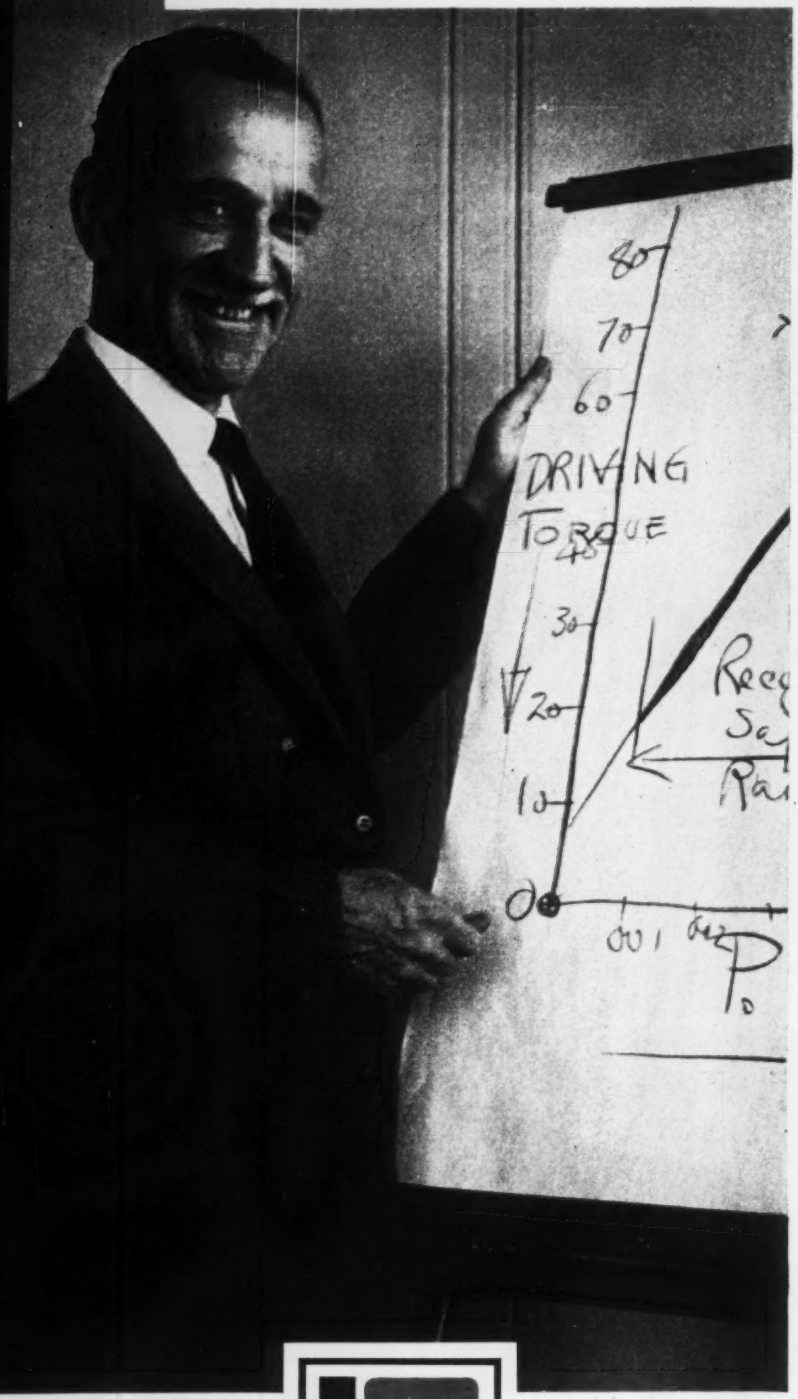
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

WILLIAM G. WALTERMIRE, *Chief Products Engineer, Lamson & Sessions, says...*



Your interest... and ours... is "assembled product cost"

Many fastener users think only in terms of unit price. Actually, labor costs of assembly are usually 3 to 4 times the price of the fastener itself.

Your job, and ours, is to find practical ways to cut your "cost of assembled product". To do this, we frequently hold meetings with purchasing personnel, design engineers, standards engineers, and quality control people at our customers' plants.

By means of charts and slides, we show how to simplify types and sizes of fasteners used, which reduces purchasing and inventory costs. We guide them in selection of thread classes to meet different material, tapping and assembly problems. We often suggest ways to improve strength and cut costs—by substituting a smaller high carbon fastener for a larger size, low carbon type. Or we may suggest redesign of a bolted assembly to use standard instead of special fasteners.

Take advantage of this no-charge L & S service. Call or write us for an analysis of *your* fastener problems.

L & S Fastener Engineering helps you "tighten up" on...

- **PURCHASING COSTS**
- **INSPECTION AND HANDLING COSTS**
- **ASSEMBLY COSTS**

LAMSON & SESSIONS

5000 TIEDEMAN ROAD • CLEVELAND, OHIO

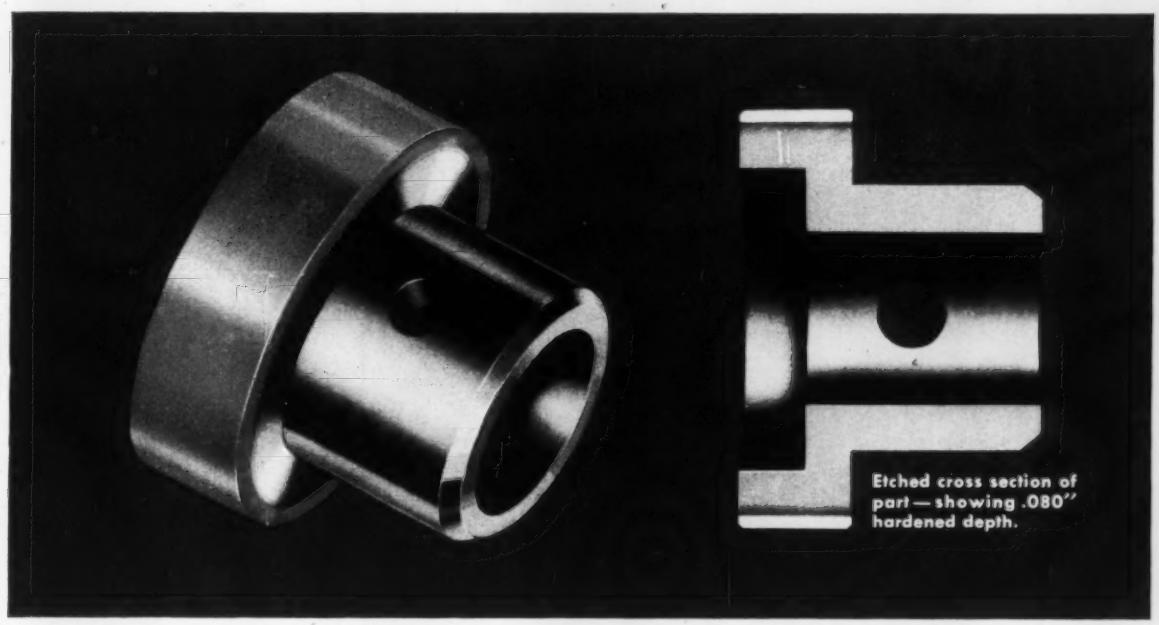
Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

Costs Cut 94%

with

TOCCO* *Induction Heating*

A cost reduction of 94% resulted when heat-treatment of this Corn Harvester part was changed from carburizing to TOCCO-hardening. Look at the unit cost breakdown:



CARBURIZING		TOCCO-*Hardening*	
Degrease	$0.0020	eliminated	
Carburize	0.0200	eliminated	
1st quench	0.0150	TOCCO, heat and quench	$0.0060
2nd quench	0.0150	eliminated	
Draw	0.0050	eliminated (self-draw)	
Shotblast	0.0035	eliminated	
Internal Grind	0.0243	eliminated	
External Grind	0.0166	eliminated	
	$0.1014		$0.0060

"... Savings of 9½ cents per piece — $4770.00 on each 50,000 piece batch, *plus* an hourly production increase from 120 to 300 pieces per hour, plus improved quality of the product by virtue of the deeper case and stronger core."

Have you investigated TOCCO's cost-savings possibilities for your hardening, brazing, melting or forging operations? Why not write us today or send blueprints of your parts — no obligation, of course.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today — NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. S-2, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____

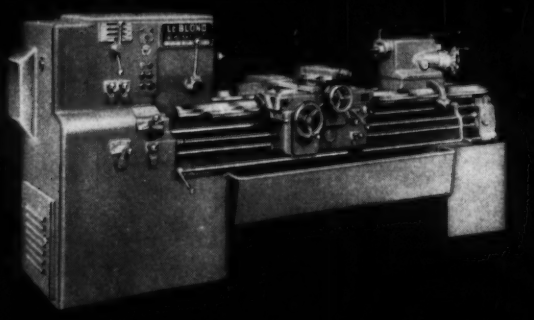
Position_____

Company_____

Address_____

City_____ Zone____ State_____

THE PRECISEST LATHES IN EVERY CLASS YOU'LL FIND IN THE LINE OF LeBLOND



This is the LeBlond 16" heavy duty engine lathe. Engineered to give you the only kind of precision that really counts—*lasting* precision. Another reason you cut with confidence on a LeBlond. Write for your LeBlond Complete Line Catalog No. C-58.

THE R. K. LeBLOND MACHINE TOOL CO.
CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

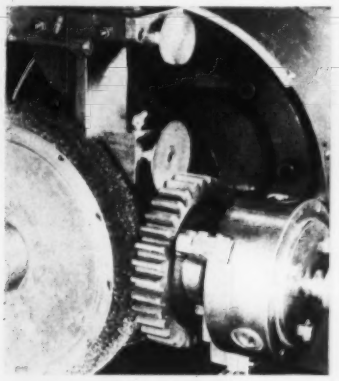
This Week in STEEL The Metalworking Weekly

February 9, 1959
Vol. 144 No. 6

EDITORIAL 43

Capability of management is the most important single factor in securing the greatest possible long term profit.

SPECIAL FEATURE 80



A power driven brush can be one of the most useful tools in your shop. This article describes various types and their uses. It also gives some tips on selecting brushing machines.

WINDOWS OF WASHINGTON 56

Committee assignments tend to indicate what sort of legislation the Democratic Congress aims to push hardest.

MIRRORS OF MOTORDOM 63

Product programming starts early at Chrysler. Profiles are compiled three years before models appear.

THE BUSINESS TREND 67

Manufacturers' inventories can be expected to continue up for the next three or four years.

WHERE TO FIND—

Behind the Scenes 6
Letters to the Editors 10
Editorial & Business Staffs .. 16
Calendar of Meetings 23
Men of Industry 71
New Products 97
New Literature 104
Advertising Index 133

Business— METALWORKING OUTLOOK 37

☑ Part Prices Firm; Small Hikes Ahead—Outlook by categories 45
Sonics Tuned to Best Year—Growth rapid, sales to increase 48
Thor Readied in 2½ Years—Sets record in missile development.. 50
Shoehorn King Employs 90—Supplies 90 per cent of the market .. 51
Steelmaking Stars in Rise of South—Growth is phenomenal 51
☑ Incentives: A Management Challenge—Benefits are shown 52
☑ Near-Record Profits on the Way—What to expect in first half .. 54
Italian Steel Firm Zeros in on World Markets 59
Firth Sterling Acquires Special Alloy Facilities 76

Production— TECHNICAL OUTLOOK 79

☑ How To Select Power Brushes—What they can do for you 80
Tantalum Liner in Vessel Stops Corrosion Problems 84
Chip Cleaning System Makes No Smoke—Afterburner is key ... 85
☑ Carbide Can Be Machined, Then Hardened—Proved many ways 86
Progress in Steelmaking—Oxygen steel: 45 million tons by '65? 88
Industrial Tire Problem Solved by New Plastic 92
☑ Cleaning and Painting in One Unit Can Cut Your Costs 94

Markets— MARKET OUTLOOK 107

Complete Index to Market News and Prices 107
☑ Why Sheet, Strip Mix Is Changing 108
Steelworks Operation Chart and District Ingot Rate 112
Scrap Jumps as Ingot Rate Rises 124
Nonferrous Metals—Copper Prices Bounce Up Again 128

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

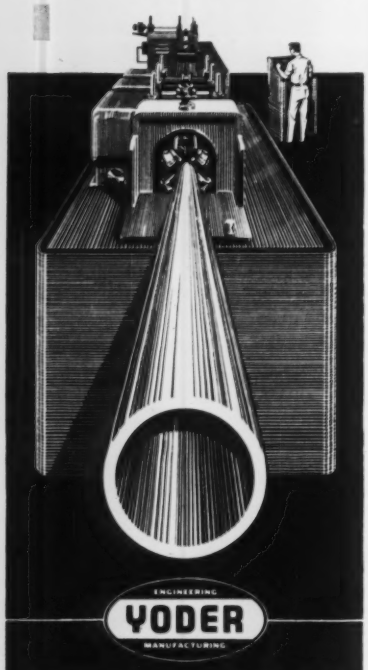
YODER

Pipe and Tube Mills

Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

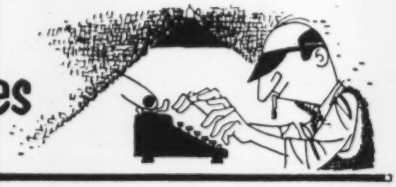
Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Pipe and Tube Mills Book.

THE YODER COMPANY
5502 Walworth Ave., Cleveland 2, Ohio



PIPE AND TUBE MILLS
(ferrous or non-ferrous)
COLD ROLL FORMING MACHINES
ROTARY SLITTING LINES

behind the scenes



You're Holding a Tool

How many persons read STEEL? To be accurate, it shouldn't be necessary to specify persons because only persons can read, anyway—and judging by the way television is smothering the art and practice of reading, a century from now it is conceivable that the printed word may shake hands with the dodo. (Figures of speech like that will hasten that lamentable day, too.)

Well, as of last week, 173,356 persons were counted as readers of STEEL. They went through it according to their particular interests and needs, of course. Some skipped through; others plowed through; still others looked at specific articles. One man confessed he thought he was looking at *Playboy*, and rushed off to have his eyes examined until he remembered that he wasn't wearing his glasses.

Those 173,355 readers (we exclude the gentleman who forgot his bifocals) don't read STEEL for entertainment: They read it to be informed. They read it to make money, to save money, to keep up with competition, to learn new methods, to discover new products, to study the offers and claims of advertisers. STEEL is really a tool; in the hands of clever persons, the information it purveys can be parlayed into potential profits.

Perils of Research

The digits arrayed above triggered a mad bit of research that has little to do with STEEL and practically nothing at all with useful information. We aimed to stack the number representing STEEL's readers against the number of persons in the world, and then astound you with some comment about the tiny but potent percentage you represent. Accordingly, we sailed over our 5 ft shelf of books and curled up with a volume that turned out to be a cross between a farmers' almanac and a preview of calamity.

It was stated that man came on the earth half a million years ago, and that in 1000 A.D. the family had grown to 400 million. Loose statements like those can be debated; they are not cause for alarm, in any event. It was the disorganized mass of additional information that made your hair stand on end. Try some of this to cheer you up on this bright Monday morning:

In 1900, world population had swelled to 1.5 billion, and in 1957, it had grown to 2.7 billion. Researchers in these matters tell us that world population is growing at the rate of 43 million annually, or 5000 per hour. Personally, we can't imagine why anybody would go to the trouble of figuring the hourly rate; it seems unnecessary, and, to our way of thinking, entirely too nosey.

Tomorrow the World

If this rate of increase continues, which seems almost inevitable, the population of the world will be 3 billion by the middle of 1962, or twice what it was in 1900! STEEL's Editor Walt Campbell and Associate Managing Editor Vance Bell are able to wring a lot of comforting information from these figures; they use them to throw light on their predictions of metalworking's fabulous future. Indeed, Vance could compare the 1900 and 1962 gross national product and warn the industry that it would have to increase its output tremendously to service its accounts in the immediate future.

Mexico will double its population in 25 years. How are you fixed for trade below the Rio Grande, hmm-m? Apparently every country in the world is growing, except Ireland and a few bypassed cannibal islands where the populations were slaves to their appetites. The most sobering fact about our fellow human beings is that most of them are hungry; indeed, of the 90 million persons who were born in 1958, half of them will always be hungry.

Oh, yes—before we forget, consider that only 10 per cent of the earth's land area is tillable: the remainder is meadow and pasture (20.2 per cent); forest and brush (27.8 per cent); and all the rest barren and waste. Seems like rocket travel will be developed just in time to permit everybody to escape into space.

STEEL's readers represent 6/1000 of 1 per cent of the population of the world, but they guide the world's greatest industry: Metalworking.

Four Coins

Some gentle reminders have come this way concerning the recent omissions of teasers at this end of the page. No sharp new ones came in, which is not at all unusual because there is nothing new under the sun. The old ones are, and of right ought to be, retired—like this one, for example: A frugal DP wished to teach his son the value of money. He gave him a nickel, a dime, a quarter, and a dollar. "So go ahead," he told the kid. "So how many different sums of money can you make with these coins, ha?"

Shrdlu

(Metalworking Outlook—Page 37)

Want a Press to Triple Your Forging Output?

We'll build the press for all your forging requirements . . .

Tell us your forging problems and give us your production specifications—we'll do the rest.

Erie Foundry, one of the first companies to automate forging, can provide specially designed *high volume* presses in capacities of 1000 to 8000 tons. Instead of the three machines and nine men formerly required, now you need only one Erie automated forging press and only one operator observer—to triple your present production rate! Trimming, too, can be accomplished in a single production cycle. With billet supply and finished part removal conveyorized, it is possible to achieve a production volume of, say, 1200 track-link forgings per hour.

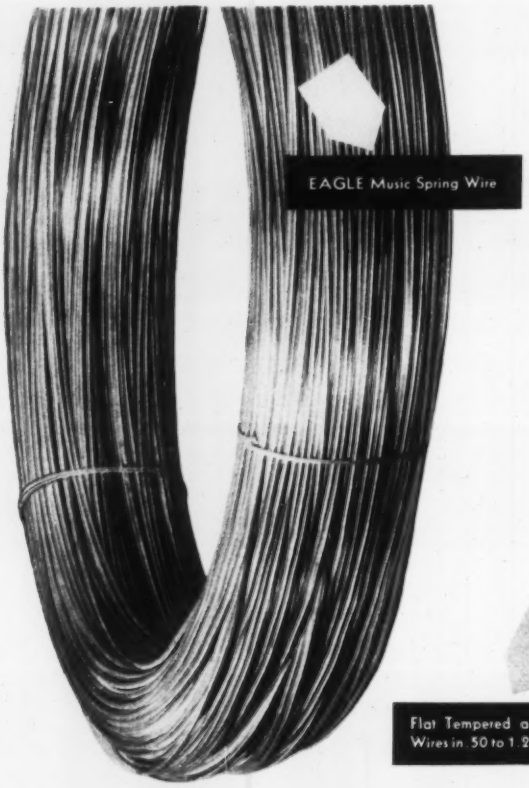
Erie Foundry has a complete line of machines designed for high volume production of such parts as connecting rods, gear blanks, automotive and tractor valves, pinions, track links and wheel hubs.

We would like to discuss application of automated presses to your production requirements. For the complete story, phone or write Mr. R. E. Sanford, Erie Foundry Company, Erie 2, Pa.

ERIE

ERIE FOUNDRY CO.

The world's great name in forging since 1895 EF-59-01



Here is the WASHBURN WIRE FAMILY

made to your specifications to insure the Quality of YOUR Product.

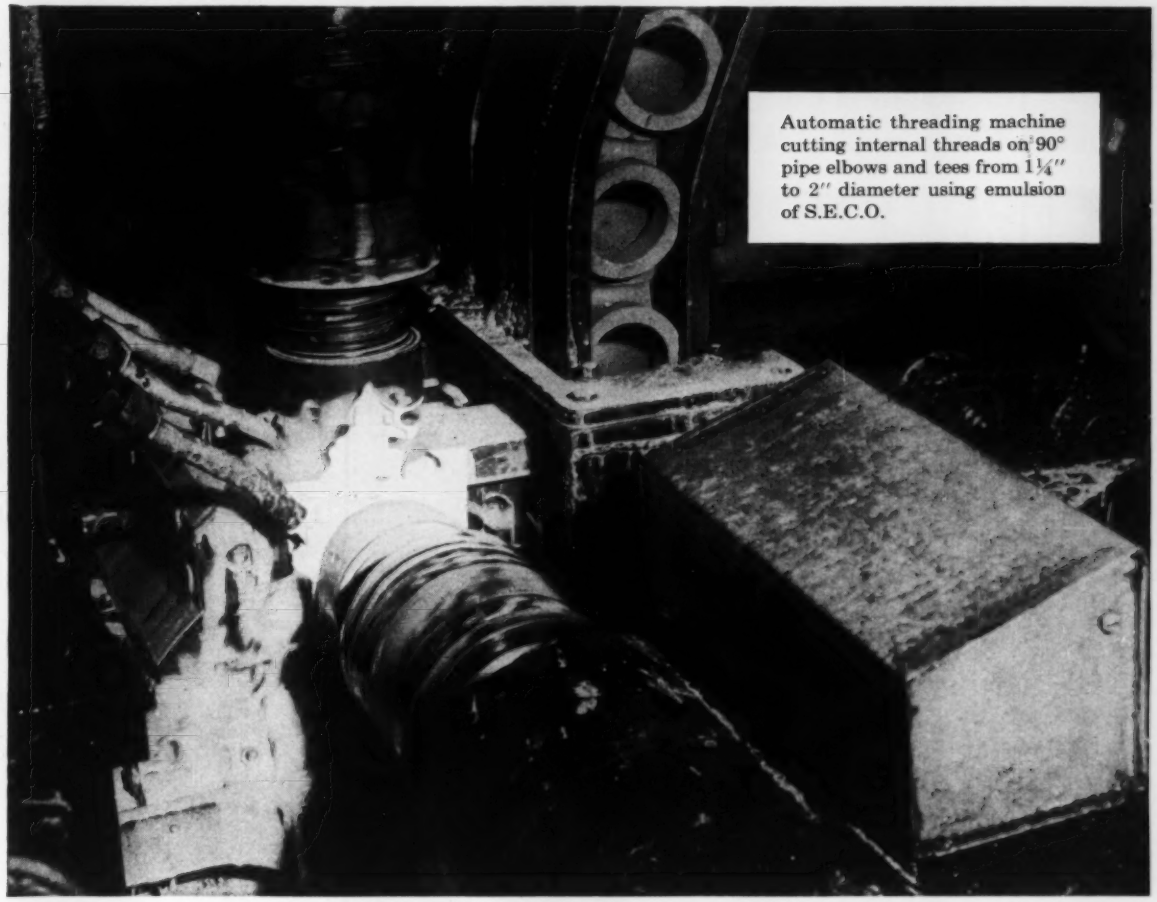
110

WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



Automatic threading machine cutting internal threads on 90° pipe elbows and tees from 1¼" to 2" diameter using emulsion of S.E.C.O.

Photo courtesy of Grinnell Corporation

NEW S.E.C.O. EMULSIONS, WITH SMALLER OIL-PARTICLE SIZE, CUT PRODUCTION COSTS

There's a new and greatly improved S.E.C.O. (Sunoco® Emulsifying Cutting Oil), that has smaller emulsion-particle size to give you the following benefits:

- BETTER PROTECTION AGAINST RUST, even at emulsion ratios as lean as 40-to-1.
- BETTER DETERGENCY, which permits dirt and fines to settle quickly out of emulsions, leaving machines clean.
- BETTER EMULSION STABILITY. Even in hard-water areas, emulsions of *new* S.E.C.O. stand up better than those made with other regular emulsifying cutting oils.
- BETTER FINISHES, CLOSER TOLERANCES. New S.E.C.O., with better coverage and wetting of work, produces consistently finer finishes in machining. Reject rate falls off. Tool life increases.

TRY *NEW* S.E.C.O.—for increased economy in all machining operations. Ask your Sun representative, or write to Department S-2.

Industrial Products Department

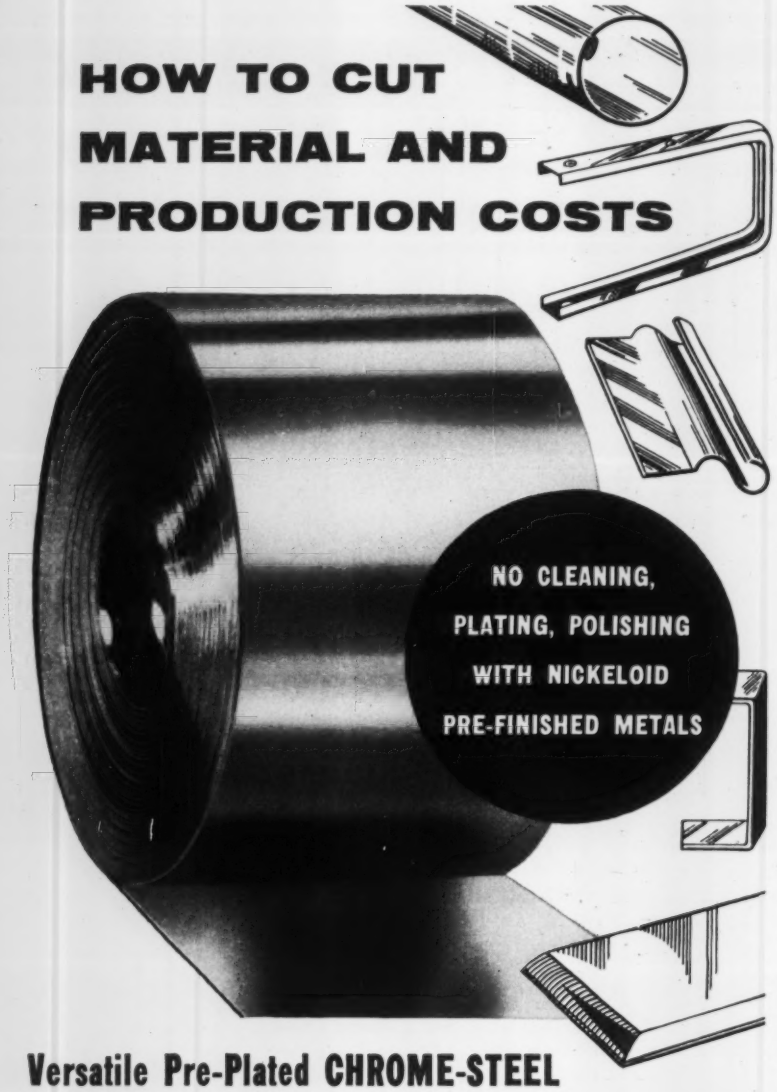
SUN OIL COMPANY, Phila. 3, Pa.

SUNOCO

© 1958 SUN OIL COMPANY

In Canada: Sun Oil Company Limited, Toronto and Montreal

HOW TO CUT MATERIAL AND PRODUCTION COSTS



Versatile Pre-Plated CHROME-STEEL and NICKEL-STEEL Now Available in Three Grades

Cut costs! — Reduce production steps! The *need* was never greater; the *method* never surer than with Nickeloid chrome-steel and nickel-steel . . . now available in C-grade, *a new low-cost utility grade* for applications that don't require the quality of our A and B grades. These cost-cutting design materials are *pre-finished* — eliminate extra handling, cleaning, racking and polishing costs, plus actual plating costs. So versatile — adaptable to standard production methods, too! Their beautiful durable finishes can add so much in sales and utility value to your products at very low cost. Cut costs, reduce production steps with Nickeloid chrome-steel or nickel-steel — big 24″ wide coils, sheets, strips; bright and satin finishes. Now save even more with new low-cost C-grade!

NICKELOID METALS SINCE 1898

Write For More Information

AMERICAN NICKELOID COMPANY

PERU 1, ILLINOIS

MILLS — Peru, Illinois and Walnutport, Pennsylvania Sales Offices Throughout the U.S.A.

LETTERS TO THE EDITORS

Requests Credit Be Given

In your article, "Here Are Two Shortcuts for Complex Parts" (Dec. 22, 1958, p. 64), you mention the Flotrusion process. Flotrusion is a division of Darco Industries and a copyright term. Thompson Ramo Wooldridge Inc. is a licensee for the process and the name Flotrusion should always carry a credit as a copyright of Darco Industries.

William P. Lester
Lester-Voorhees Co.
Los Angeles

Shows Interest in Salary Rates

"Here's How To Build Salary Rates" (Jan. 19, p. 42) is excellent. May I have an extra copy?

B. G. Rudneff
Personnel
Kaiser Aircraft & Electronics Div.
Kaiser Industries Corp.
Palo Alto, Calif.

• • •

Since we found this first article of such great interest, may we request that copies of the two subsequent articles be sent to us also?

W. J. Allaback
Director of Operations
Thew Shovel Co.
Lorain, Ohio

• • •

We found this article extremely interesting. May we have an extra copy?

Burt Ganz
Titan Industrial Corp.
New York

Article Explains Phenomena

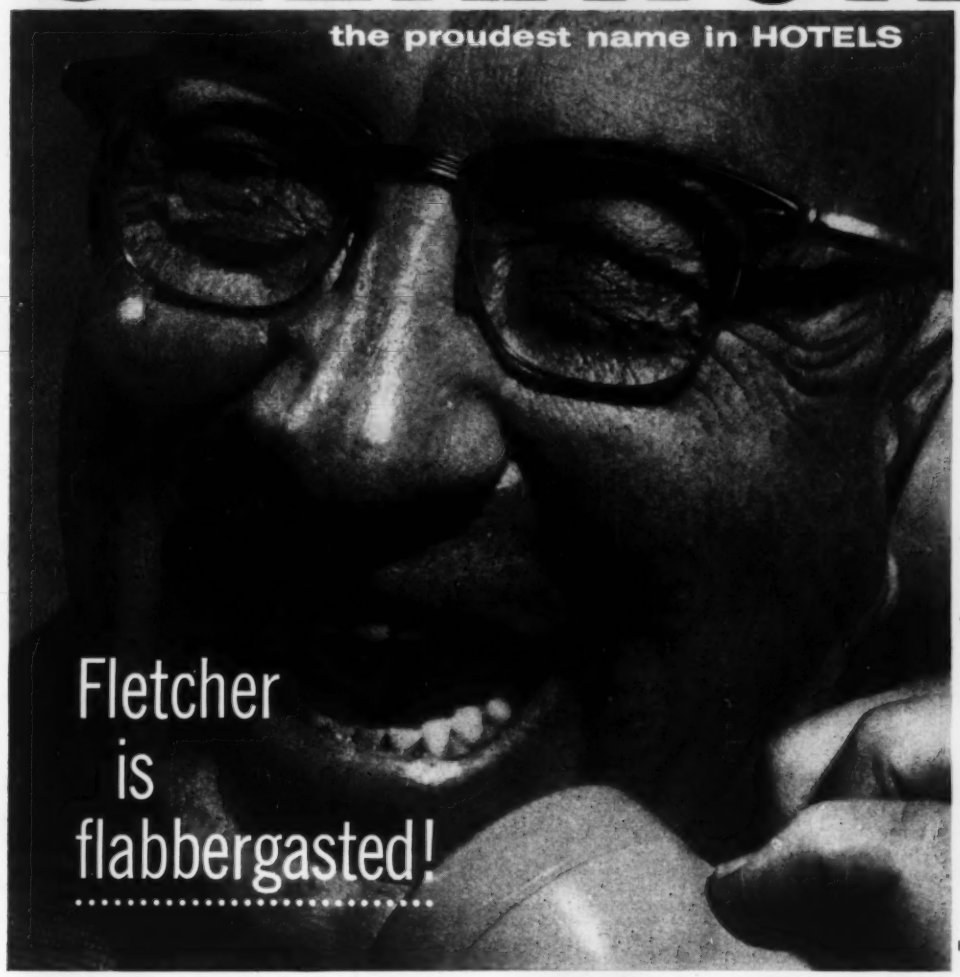
"Why Explosive Forming Works" (Jan. 19, p. 62) has just come to my attention.

I should like to congratulate you on the article, not only as a good follow-up but also as a serious attempt to explain some of the phenomena attending explosive metalworking. That approach, I feel, will do more to advance the art than anything that has been said to date. We encounter much frank skepticism in our attempts to sell the process in this

(Please turn to Page 12)

SHERATON

the proudest name in HOTELS



Which of these 39 cities is your next stop?

EAST
NEW YORK
BOSTON
WASHINGTON
PITTSBURGH
BALTIMORE
PHILADELPHIA
PROVIDENCE
ATLANTIC CITY
SPRINGFIELD, Mass.
ALBANY
ROCHESTER
BUFFALO
SYRACUSE
BINGHAMTON, N.Y.
(opens early 1959)

MIDWEST
CHICAGO
DETROIT
CLEVELAND
CINCINNATI
ST. LOUIS
OMAHA
AKRON
INDIANAPOLIS
FRENCH LICK, Ind.
RAPID CITY, S. D.
SIOUX CITY, Iowa
SIOUX FALLS, S. D.
CEDAR RAPIDS, Iowa

SOUTH
LOUISVILLE
DALLAS
(opens early 1959)
AUSTIN
MOBILE

WEST COAST
SAN FRANCISCO
LOS ANGELES
PASADENA
PORTLAND, Oregon
(opens fall 1959)

CANADA
MONTREAL
TORONTO
NIAGARA FALLS, Ont.
HAMILTON, Ont.

. . . Sheraton's ***RESERVATRON*** got him his hotel reservation in just 4 seconds!

A call to the nearest Sheraton Hotel sets in motion the world's fastest hotel reservation service. ***RESERVATRON,*** new electronic marvel, reserves and confirms your room in any Sheraton Hotel coast to coast in split seconds! For hotel reservations for your next trip, just phone Sheraton. Let ***RESERVATRON*** take it from there.

FREE BOOKLET to help you plan trips, sales and business meetings, conventions. 96 pages, describing Sheraton facilities in 39 major cities. **MEMBERSHIP APPLICATION** for the Sheraton Hotel Division of the DINERS' CLUB. This card is an invaluable convenience for the traveler — honored for all Sheraton Hotel services.

Just send us this coupon —

Sheraton Hotels, Dept. 51, 470 Atlantic Ave., Boston 10, Mass.

Please send me, without obligation: ☐ Sheraton facilities booklet

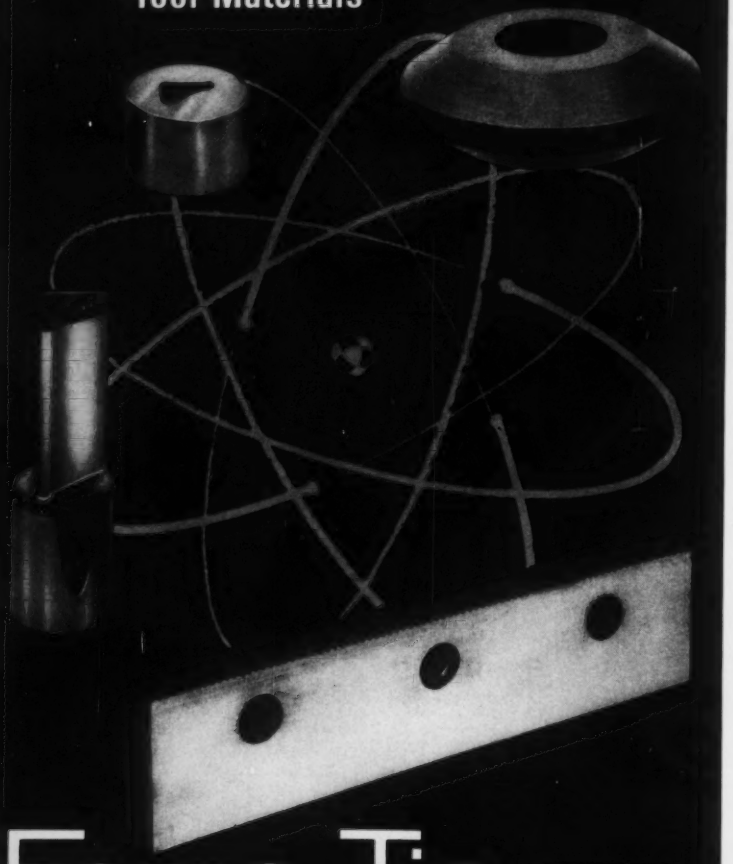
☐ Membership application for the Sheraton Hotel Division of the Diners' Club

Name .....

Address .....

City ..... *Zone* ..... *State* .....

A completely new concept in Tool Materials



Ferro-Tic (with proven performance)

the only machinable carbide in existence!

FOR: Blanking, Laminating, Deep Drawing and Heading Dies, Arbors, Core Rods, Wear Parts, etc.

FERRO-TIC combines the fabricating advantages of steel with the wear-resistance of carbide. In the annealed, completely dense state, FERRO-TIC can be machined with high-speed steel tools on conventional tool room equipment; thus, the need for costly diamond grinding is eliminated. Once hardened, by oil quenching from 1750°F, FERRO-TIC is extremely hard and wear-resistant. FERRO-TIC stock blanks can be fabricated into long-wearing carbide components, using available tools and skills without delay!

FERRO-TIC can be
- **TURNED**
- **DRILLED**
- **MILLED**
- **SAWED**
- **TAPPED**

AGENTS THROUGHOUT THE U.S.A.

Write or telephone for complete information:

SINTERCAST
CORPORATION OF AMERICA
136 Woodworth Avenue, Yonkers 2, N.Y. YOnkers 9-6767

LETTERS

(Concluded from Page 10)

area. No doubt others have the same experience.

Joseph L. Bird
Nitroform Inc.
Birmingham, Mich.

• • •

We are much interested in the excellent article. If reprints are available, may we have at least six for our seminars?

Horace Frommelt
Director
Spring Garden Institute
Philadelphia

Information Interests Managers

"Changing Role of Metalworking Managers" (Jan. 5, p. 95) was most interesting to our management. We believe the information contained in this article would also interest the superintendents of our several plants. May we have additional copies?

Charles W. Mercill
Assistant to the President
Haws Refractories Co.
Johnstown, Pa.

• • •

Your article was interesting to me and I would appreciate it if you would send a copy to the vice president of our company in New York.

John G. Wehn
Manager
St. Joseph Lead Co.
Monaca, Pa.

Enjoyed Reading Breakeven Point

In "Breakeven Point: Route to Better Decision Making" (Dec. 1, 1958, p. 40), I enjoyed reading about the new approaches in determining the breakeven point in different business situations. I would appreciate receiving a copy of this article.

H. J. Coughlin
Manager-Quality Control
Home Laundry Dept.
Hotpoint Co.
Chicago

Wants Copies for Departments

I was much interested in "Continuous Casting, Impact Extrusions Spark Revolution in Aluminum Partmaking" (Jan. 12, p. 70). May I have three copies of this article for distribution to our engineering, metals research, and aluminum casting departments?

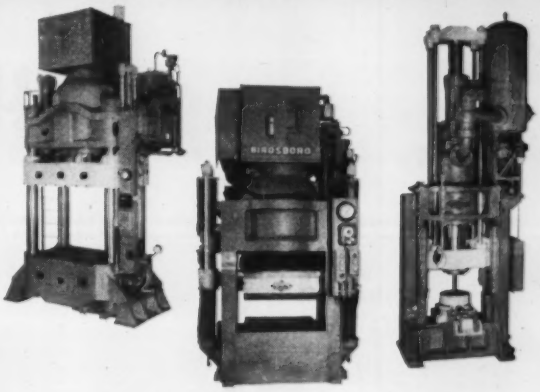
E. S. Barnes
Mill Products Engineer
Scovill Mfg. Co.
Waterbury, Conn.

• • •

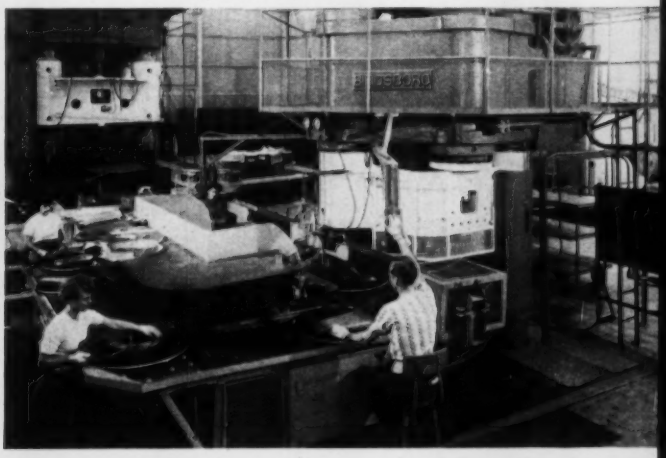
It would be much appreciated if you would send us two copies. We are most interested in this subject, and feel the article would be of much help.

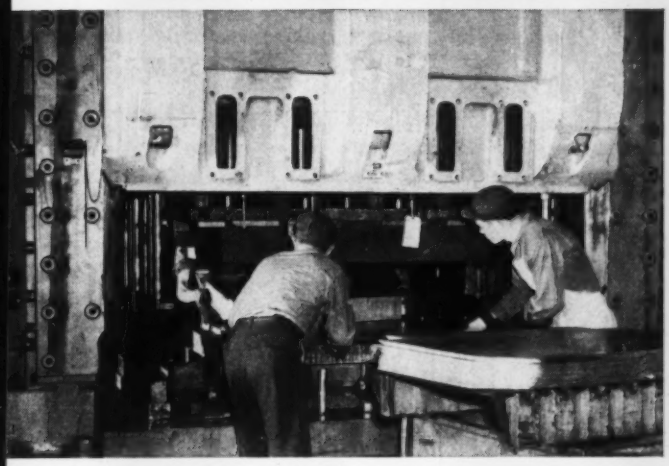
L. G. Brotzman
Partner
Western Metal Decorating Co.
El Segundo, Calif.

Get the most from
both men and machines...
with advanced design
BIRDSBORO *Hydraulic Presses*



• Getting the most from your production crews depends a great deal on the equipment, and getting the most from your equipment depends a great deal on its design. As the importance of design increases, BIRDSBORO's emphasis on this factor has increased. Several BIRDSBORO hydraulic presses are being used in research *today* to determine the design features that will be needed to meet the performance requirements of *tomorrow*. Advanced design and versatility go into every press by BIRDSBORO. For reports on what they can mean to you, contact your BIRDSBORO representative. *Sales Department:* Reading, Pa., *Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.





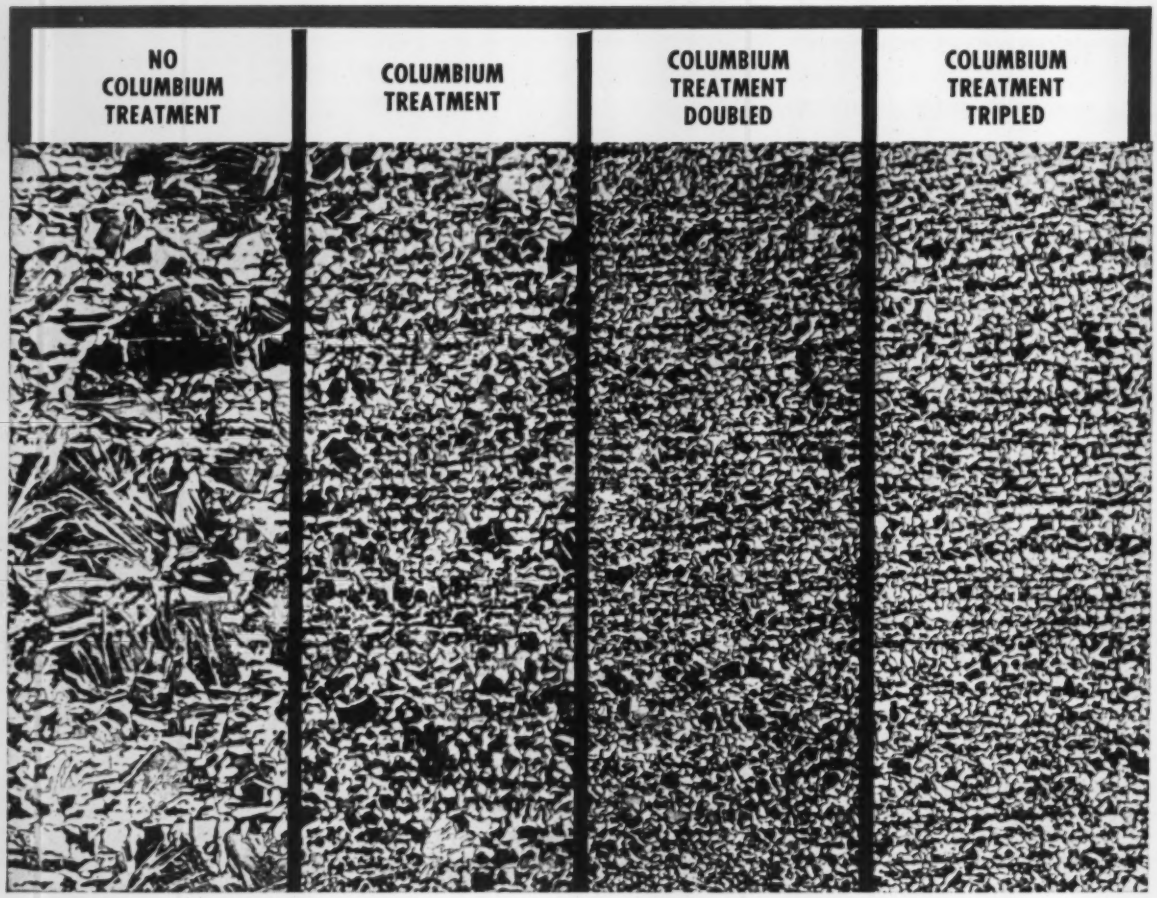
HP-39-53

BIRDSBORO HYDRAULIC

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY •
STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

HOW GREAT LAKES



Composite of photomicrographs made from the same heat of mild carbon steel shows the effect of varying columbium treatments on the grain structure of the steel.

The Great Lakes Family of High-Strength Steels

N·A·X FINEGRAIN STEEL

Lets you design superior performance, longer life and less weight into your product. Many diversified applications.

N·A·X HIGH-TENSILE STEEL

Offers all the characteristic features of N-A-X Finegrain, plus greatly enhanced resistance to atmospheric corrosion.

GLX W

A series of fine grained, mild carbon steels. They have unusually high strength, toughness and weldability.

N·A·X N-A-XTRA STEELS

Quenched and tempered steels of excellent weldability and toughness, with yield strengths from 80,000 - 110,000 psi.

N·A·X HIGH MANGANESE STEELS

N-A-X High Manganese and High Manganese Special Killed. These steels give yield strengths up to 50,000 psi.

STEEL CORPORATION'S NEW GLX-W STEELS GIVE ... HIGH STRENGTH TOUGHNESS REDUCED COSTS

Key to the success of Great Lakes' new GLX-W Series of steels is the fine grained internal structure produced by treatment with columbium. This grain refinement also contributes to ductility. And in addition, the GLX-W Series' low carbon and manganese content assures excellent weldability with freedom from underbead cracking under all conditions.

COST AND WEIGHT SAVINGS

Where design permits the replacement of carbon steel with GLX-W steels, weight savings of 20 to 35 per cent, and cost savings of 10 to 25 per cent can be realized. When replacing alloy steels the cost savings can range from 25 to 35 per cent. These steels feature higher yield strengths, greater tensile strengths and increased toughness without costly heat treatments or extensive alloy additions.

The GLX-W Series is so priced that substantial cost reductions can be obtained by weight reduction over mild carbon steel. Cost reduction can also be obtained over alloy steels because of the lower price of GLX-W steels.

STRONGER AND TOUGHER

GLX-W steels are stronger and tougher than ordinary mild carbon steels and in some applications can do the job now being done by the more costly alloy steels.

MANY USES FOR GLX-W STEELS

GLX-W steels are especially recommended for a broad range of applications in mobile equipment and pressure vessels, as well as the transportation and construction fields.

GLX
W

For additional technical information about these economical GLX-W steels write

Product Development Division, Dept. B-1
GREAT LAKES STEEL CORPORATION
Detroit 29, Michigan • Division of
NATIONAL STEEL CORPORATION

TUBULAR RIVET COST-SAVINGS MULTIPLY WITH MILFORD'S ASSEMBLY ANALYSIS

WE STUDY THE FUNCTION

2. WE DESIGN THE RIGHT PART

3. WE RECOMMEND THE BEST ASSEMBLY TECHNIQUE

Smart production men know that a cleverly designed product that can't be assembled economically is worse than no product at all! Milford helps with a wealth of assembly tips.

For the answers to assembly problems ... *get in touch with Milford first!*

THE MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNA.
ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
ROBERT M. LOVE .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Associate Editor
DERRY EYNON .....Assistant Editor
NEIL C. ROBERTS .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
WILLIAM M. OLDS .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant
JANE WEDGE .....Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON, H. GLENN CANARY
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212. HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK
Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany ....DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 1-2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

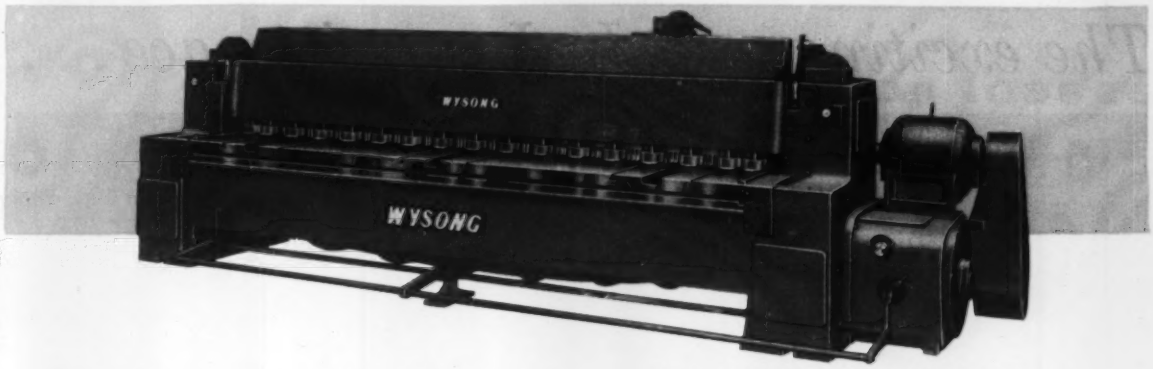
BPA

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.



MODEL 1225 — Capacity 12' x ¼". Other models from 24" through 12' cutting lengths and 16 ga. through ½" capacities.

THE SHEAR

THEY DIDN'T REMEMBER*

It was a big company with a new Purchasing Agent. He didn't remember a shear bought two years ago. He did find a record of its purchase but no report on its performance.

The Production Manager recalled its installation but he didn't have a record of performance either. So he got the Foreman of the Fabricating Department on the phone.

"Joe, you have squawked about troubles you have had with some of your shears and I have your reports on them. But, I don't have any report on that Wysong shear we installed a couple of years ago. How come?"

"Well, boss, what's there to report? The only time it's been down was when we changed blade edges. It has automatic lubrication so there is practically no maintenance. It's working every day and gives us the accuracy we want — the production, too. There is nothing to report!"

When you install a Wysong don't expect a lot of reports on it — just unsurpassed accuracy, minimum down time and maximum production. That is why so many users say:

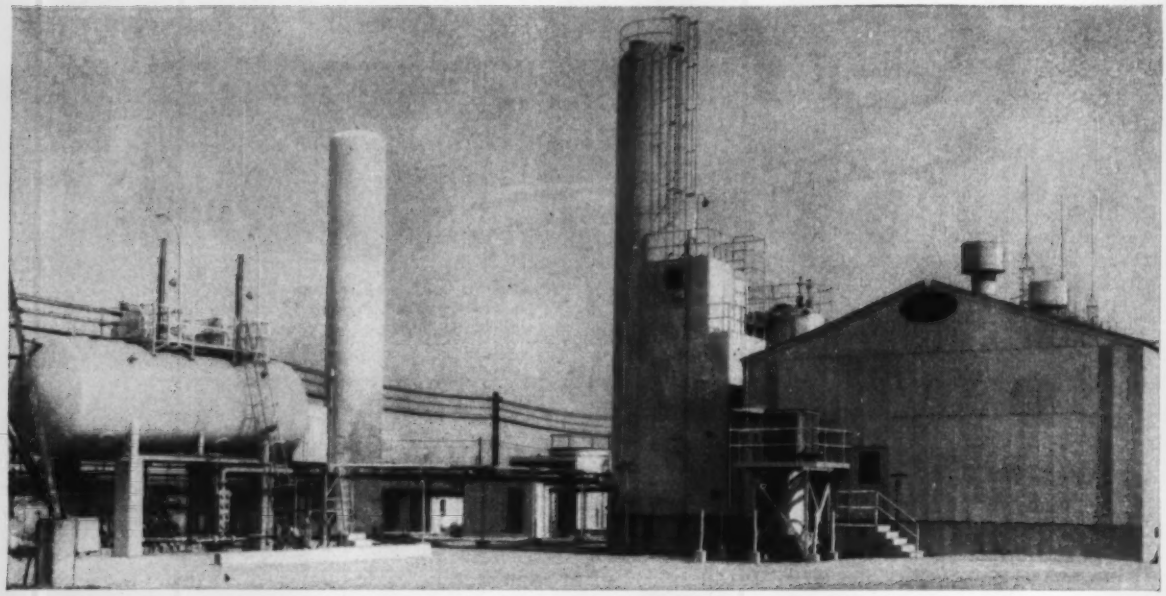
"Buy a **WYSONG** — it's **MILES** ahead"

* *Based on experience of Wysong service man making a routine check.*

WYSONG

WYSONG & MILES COMPANY
635 Fulton Street
GREENSBORO, N. C.

The exciting new J & L sets its pace . . .



This LINDE On-site Plant is located at J & L's Cleveland Works. Capacity—48,000,000 cu. ft. mo.

and LINDE helps them keep it!

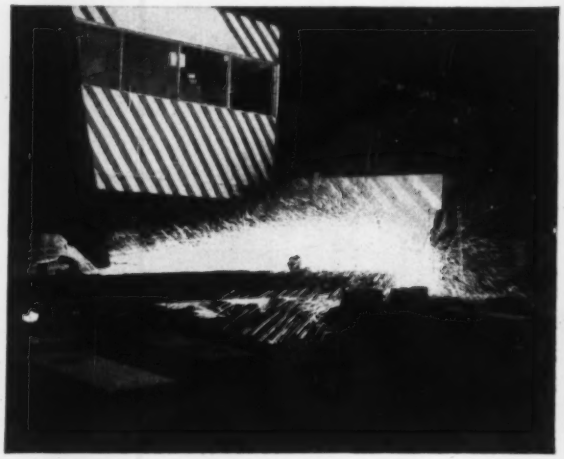
LINDE's Oxygen supply system and scarfing process are geared to production requirements at Jones & Laughlin's Cleveland Works.

All oxygen demands—in the furnace and on the finishing line—are easily handled by LINDE's On-site Plant. BUT . . . intermittent demands require LINDE's flexible supply system—a reliable producing plant PLUS the ability to deliver "peak" and "back-up" requirements from a nationwide liquid oxygen producing and delivery system.

LINDE's supply system and scarfing process meet fluctuations in production as well. When demand dips the oxygen supply is immediately cut back and the LIN-DE-SURFACER Scarfing Machine is regulated or rolled off the line in a matter of minutes.

Whatever the pace set by J & L, LINDE is there right down the line helping to meet the schedule.

For further information, write Dept. **ST-22**, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.



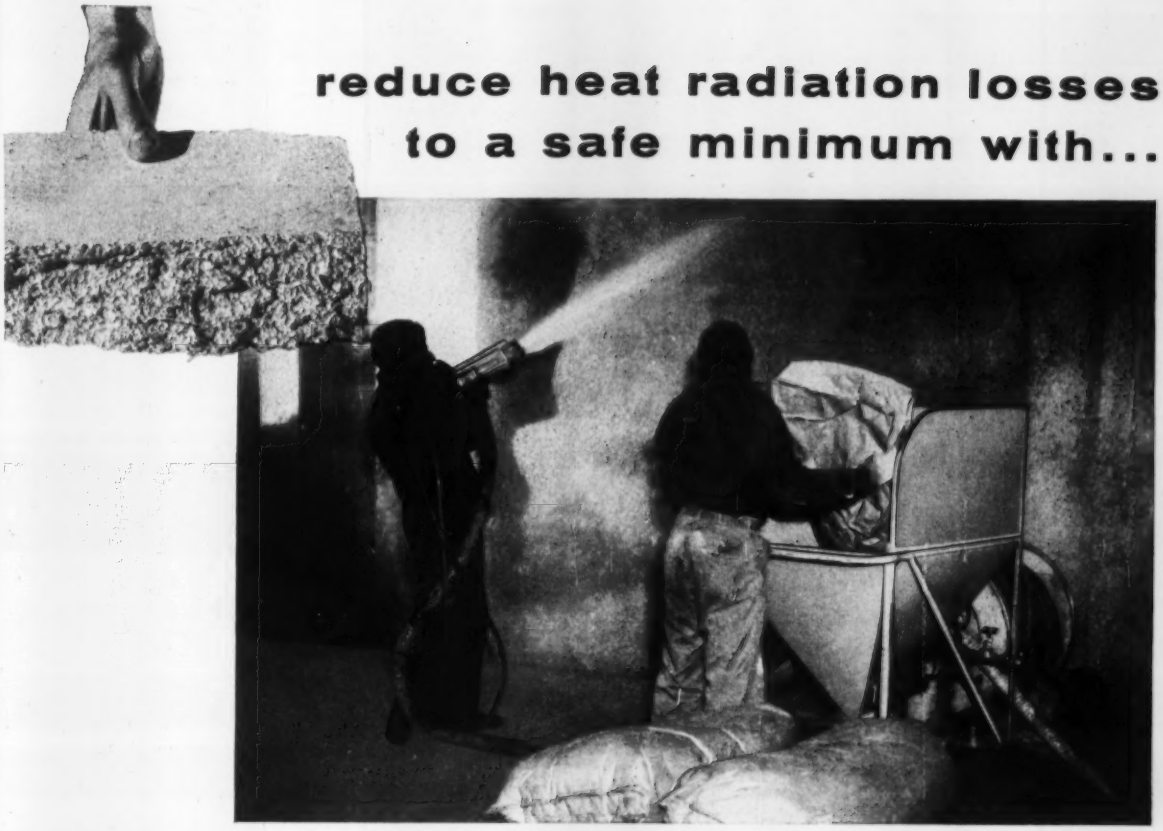
A LIN-DE-SURFACER Scarfing Machine, like the one shown here, is used by J & L to condition steel destined for the automotive industry.

The terms "Linde," "Lin-De-Surfacer," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Linde

UNION CARBIDE

reduce heat radiation losses to a safe minimum with...



THERM-O-FLAKE HIGH TEMPERATURE INSULATION

THERM-O-FLAKE COATING . . . ideal for sealing furnace walls by applying as a thin layer directly on the furnace brickwork. Sticks tightly and forms a highly impermeable coating.

THERM-O-FLAKE L. B. INSULATION BLOCK . . . a back-up insulation with high mechanical strength. Used extensively for open hearth and processing furnaces, hot blast stones, etc. Available in standard flat blocks and special shapes to order.

THERM-O-FLAKE BRICK . . . provides high insulating efficiency and stability at temperatures to 2000°F. Very lightweight. Absorbs expansion stresses of refractory brickwork without disintegration. One inch thickness is equivalent to 6½ inches of fire brick in resisting heat transfer.

THERM-O-FLAKE GRANULES . . . an extremely light weight, loose fill insulation for temperatures up to 2000°F. Composed of selected, graded particles of pure exfoliated vermiculite. Will not crumble, rot or disintegrate, non-irritating.

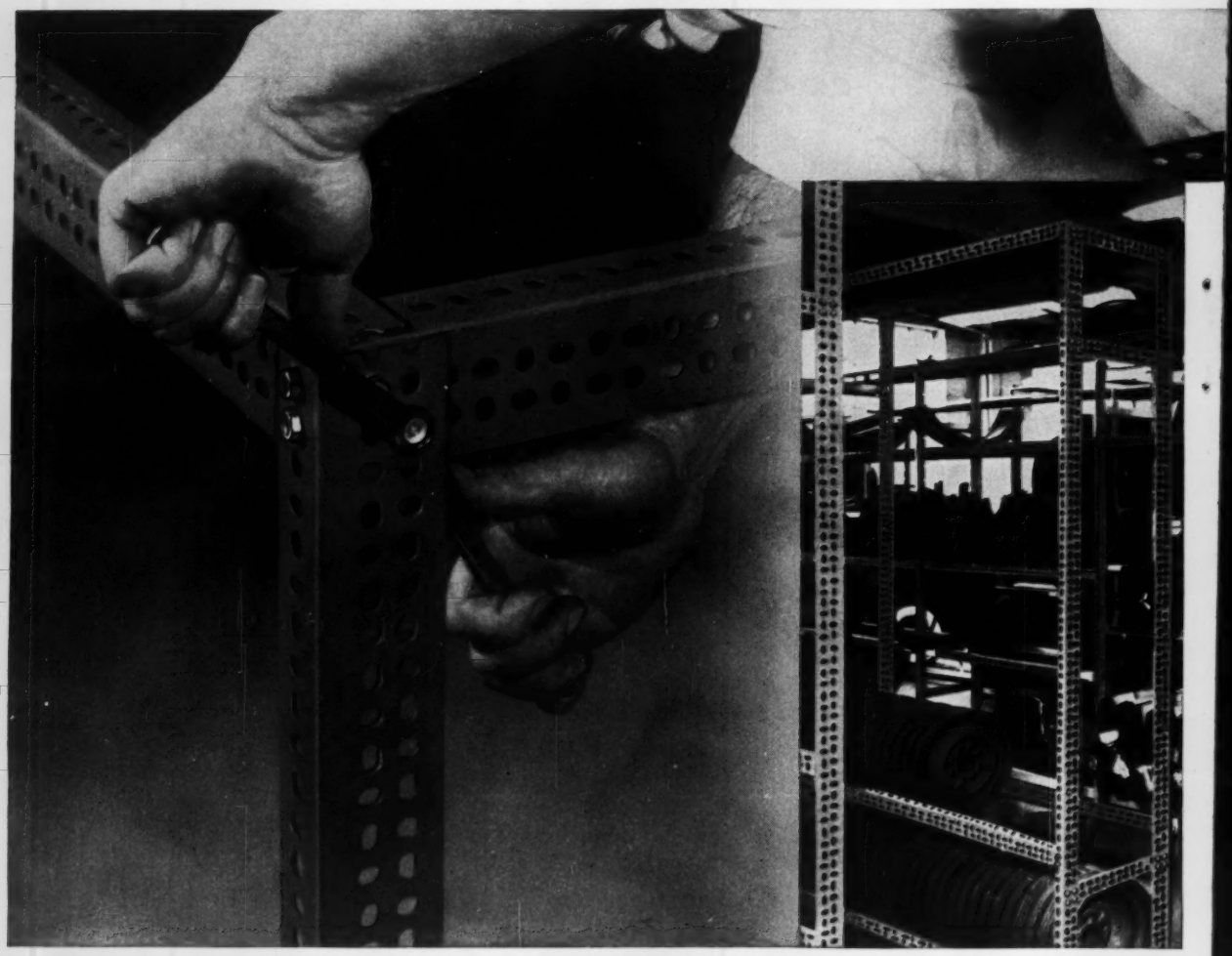
THERM-O-FLAKE CONCRETE . . . insulating concrete recommended for a maximum hot face exposure of 2000°F. Weighs only 40 lbs. per cubic foot. A one inch thickness is equivalent in insulating value to two inches of diatomaceous earth type concretes.

Goose Lake THERM-O-FLAKE Insulation products are specifically produced for open hearth furnaces and other steel plant installations requiring an efficient insulation material for temperatures up to 1900°F. They are made from a base of exfoliated vermiculite, the most stable and efficient high temperature insulation available. THERM-O-FLAKE Insulation products are approved and used regularly by most steel plants in the United States. Write today for complete information.

ILLINOIS CLAY PRODUCTS CO.

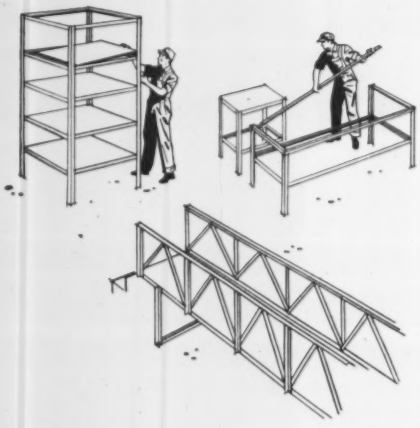
Main Office—Barber Building, Joliet, Illinois
Sales Office—208 South LaSalle Street, Chicago 4, Illinois

MANUFACTURERS OF: GOOSE LAKE Ladle Brick, Ground Fire Clay, Fire Clay Flour; GRUNDITE Bond Clay; FIROX; THERM-O-FLAKE Insulation Coating, Brick, L.B. Block, Concrete; CHEM-BRIX, Silica, Carbon



REPUBLIC METAL LUMBER

...new building material meets every framing need



Now . . . new building material made of steel with all the framing erection conveniences of common lumber. Republic's new slotted-angle METAL LUMBER is unlimited in application.

Secret is the precision-engineered system of short slots placed to allow ¾″ vertical and horizontal adjustment for utmost flexibility in meeting design requirements. Two-way short-slot pattern provides sufficient bolts in bearing to assure adequate joint strength. Easy to use—simply measure, cut, assemble.

Republic METAL LUMBER® is Bonderized, finished with baked enamel after fabrication for greater resistance to rust and damage. Delivered in easy-to-handle bundles of 10 angles, .080 gage or .104 gage, 10- or 12-foot lengths, hardware included. Stores in same space as one 2″ x 4″ piece of lumber.

Save time, space, and money in building storage racks, catwalks, supports, guard rails, special purpose tables, facilities. Call your Republic representative or write for idea-packed catalog.

MORE REPUBLIC STORAGE AND MATERIALS HANDLING PRODUCTS THAT SAVE MANUFACTURERS AND FABRICATORS TIME AND MONEY...

REPUBLIC WEDGE-LOCK LONG PARTS STORAGE UNITS are easy to load, unload from either side. The heavier the load, the tighter the grip because Wedge-Lock construction includes the three prime essentials of good shelving: 1. A post that will not bend; 2. A reinforced shelf that does not sag; 3. A concealed sway-proof joint. Republic Storage Engineering specialists help you plan. Write today.

REPUBLIC MATERIALS HANDLING SPECIALISTS engineered these steel boxes to the requirements of the Kropp Forge Company, Chicago, Illinois. Special features include corrugated construction for strength, smooth channel around the top to eliminate sharp edges, four-way fork channels to simplify handling, and stacking brackets to permit tiering to any practical height. For materials handling ideas that save space, time, and money, call Republic or send coupon.

TRUSCON "BUDGET BUILDINGS"...3-WEEK DELIVERY from order to job-site! Here's top utility at lowest cost—the fast, easy way to provide industrial housing or to enlarge manufacturing facilities. Truscon "Budget Buildings" are available in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any length necessary. Roofing, siding, windows, doors, hardware shipped as a package. Erection is fast, easy. Send for brochure.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

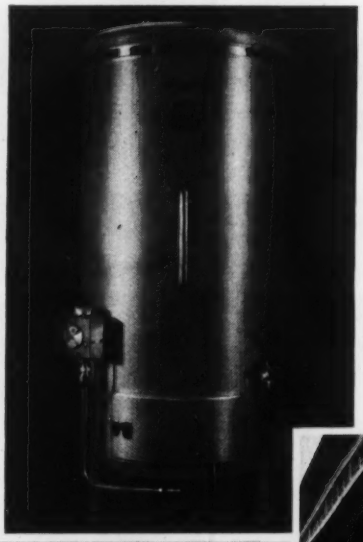
REPUBLIC STEEL CORPORATION
DEPT. ST-6514-R
1441 REPUBLIC BUILDING · CLEVELAND 1, OHIO

Please send information on the following:

☐ Republic METAL LUMBER ☐ Wedge-Lock Shelving
☐ Truscon "Budget Buildings"
☐ Have a Materials Handling Engineer call

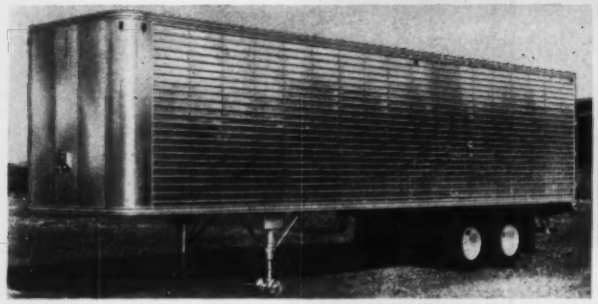
Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

When aluminum is part of your product . . .

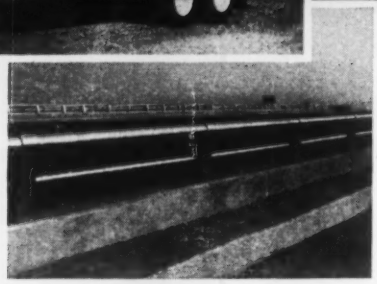


Appliances

Building Materials



Transportation Equipment



Bridge Railing

check with Anaconda Aluminum

If your product demands aluminum to exact specifications—and you're not getting it—call on Anaconda!

Custom production, combining precision control of the most modern equipment available with the craftsmanship of aluminum experts, assures you that Anaconda Aluminum always matches your product specifications precisely. And the flexibility of our modern plant facilities gives your orders fast action, prompt shipment.

Talk over your requirements for pig and ingot, coiled and flat sheet, extruded shapes, structurals, rod, bar and tubular products now with your local Anaconda Aluminum representative . . . or write our General Offices, Dept. S-2, Louisville 1, Kentucky.

Remember...

EVERY INDUSTRY HAS ONE MEMBER
WHO SPECIALIZES IN CUSTOMER SATISFACTION

ANACONDA ALUMINUM

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE, KENTUCKY

CALENDAR
OF MEETINGS

Feb. 9-11, American Management Association: Marketing conference, Statler-Hilton Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Marketing division's manager: Coleman Lee Finkel.

Feb. 15-19, American Institute of Mining, Metallurgical & Petroleum Engineers Inc.: Annual meeting, St. Francis, Sheraton-Palace, and Sir Francis Drake Hotels, San Francisco. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Feb. 15-21, Association of Steel Distributors Inc.: Annual convention, British Colonial Hotel, Nassau, Bahama Islands. Association's address: 29 Broadway, New York 6, N. Y. Counsel: Morris Rosoff.

Feb. 16-18, American Management Association: Midwinter personnel conference, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. Personnel division's manager: John D. Staley.

Feb. 17-19, Caster & Floor Truck Manufacturers Association: Winter meeting, St. Moritz Hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: Harry P. Dolan.

Feb. 18-19, Malleable Founders' Society: Technical and operating conference, Wade Park Manor Hotel, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

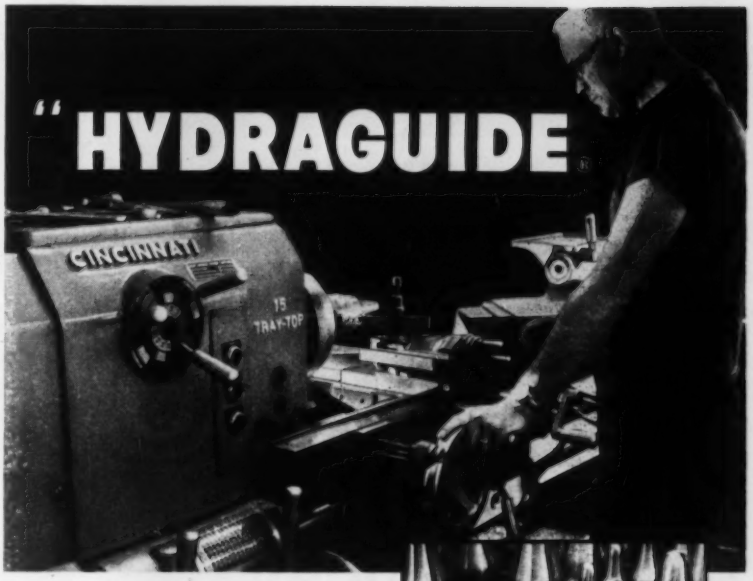
Feb. 23-25, American Management Association: Research and development conference, LaSalle Hotel, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. R&D division's manager: Philip Marvin.

Feb. 25-27, Electronic Industries Association: Annual industrial relations conference, Chase-Park Plaza Hotel, St. Louis. Association's address: 1721 DeSales St. N. W., Washington 6, D. C. Secretary: James D. Secrest.

Feb. 26-27, Alloy Casting Institute: Winter meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

Mar. 5-7, Western Space Age Conference: Great Western Exhibit Center, Los Angeles. Sponsor: Los Angeles Chamber of Commerce, 404 S. Bixel St., Los Angeles 54, Calif.

Mar. 9-10, International Acetylene Association: Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 30 E. 42nd St., New York 17, N. Y. Secretary: L. G. Matthews.



helps cut our plunger costs in half!"

. . . says
ANCHOR HOCKING GLASS CORPORATION

Various sizes of plungers from ⅝" to 1⅜" tip diameters are machined with .001" tolerance from N-3 steel preforms on the 15" HYDRAGUIDE. Cincinnati HYDRAGUIDE Tracer Lathes are built in 15" and 18" swing sizes and a variety of bed lengths.

"We're now saving more than 50% of our former outside cost in producing glass machine plungers", says James Madden, Superintendent of the Winchester (Ind.) plant of Anchor Hocking Glass.

Contributing greatly to this saving is the new 15" CINCINNATI HYDRAGUIDE which handles about 60% of the production. All operations of rough cutting, automatic profiling and polishing are performed on the lathe. In addition to the unvarying contours obtained, the smoothness of HYDRAGUIDE's hydraulic tracer mechanism is also credited with reducing the polishing operations required to produce the 25-30 Micro finish.

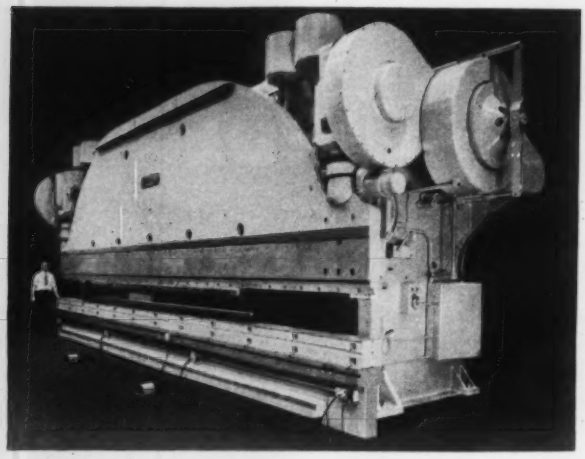
Ask your CL&T Dealer to discuss HYDRAGUIDE tracer lathe applications in your plant. Or, write us direct.

Improved Machining Through Research

CINCINNATI LATHE AND TOOL CO.

3210 Disney Street • Cincinnati 9, Ohio

"TRAY-TOP" Lathes • "CINCINNATI" Drilling Machines
"SPIROPOINT" Drill Sharpener



How Cincinnati® Press Brake construction lowers job costs

Only accurate machines can make accurate bends. The accuracy obtainable from a press brake begins with its structural rigidity. Cincinnati® Press Brakes give you maximum accuracy and rigidity because of these construction features:

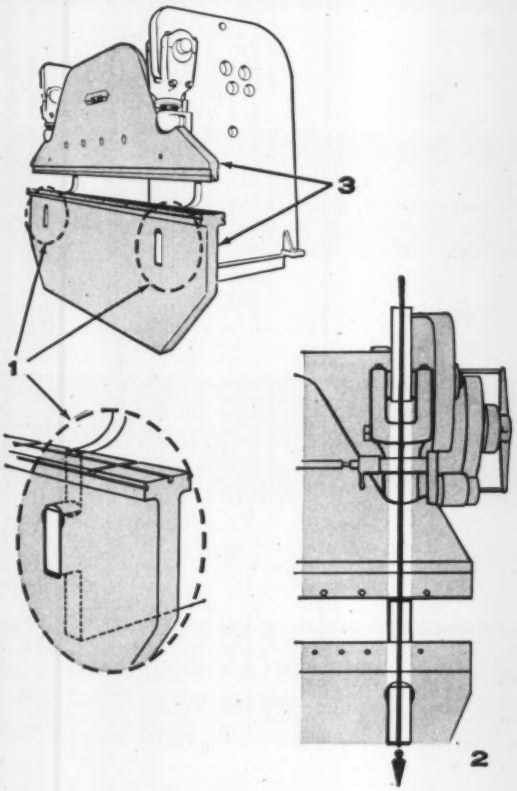
1. Interlocked construction—The bed is supported directly by the housings, by means of hand-scraped bearing shoes. No welds are used as load supports, so every Cincinnati is free from welding strains.

2. Center line loading—Since the Pitmans which drive the ram *straddle* the housings, weaving of the frame and cramping of the ram slides and shaft bearings is eliminated. All operating forces are contained within the housings.

3. Deep beds and rams—It's a simple engineering fact that the rigidity of a press brake's ram and bed increases approximately as the cube of the depth. For this reason, most of the weight of the ram and bed of a Cincinnati® Press Brake is disposed in depth, rather than thickness. Tests prove their working surfaces remain parallel within .005″ under capacity loads.

To you these construction features mean money saved in the long run. A Cincinnati® Press Brake is more accurate than other makes when you buy it . . . and will stay that way throughout its long life.

Write Department C for Catalog B-5.



Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO. Cincinnati 11, Ohio, U.S.A.

USERS OF **NEW**
ROEBLING HERRINGBONE* WIRE ROPE
HOLD THESE TRUTHS
TO BE SELF-EVIDENT...

That Herringbone is the most practical and *needed* wire rope development to come along in years.

Herringbone, the regular lay and Lang lay rope, is actually two-ropes-in-one rope. Thus, the qualities that make these two ropes *good* ropes, combine to make Herringbone *excellent.*

HERE'S WHY:

The steel core of Herringbone provides the *ideal* support for the two pairs of Lang lay and one pair of regular lay strands used in its construction. In addition, the outer wires are heavier for extra abrasion resistance, and good flexibility is maintained by the finer wires inside. This combination of features enables Herringbone to give *longer service* in most applications.

Herringbone has been used on a wide variety of excavating equipment and tough hoisting jobs with impressive results. Its applications are practically unlimited on installations which call for all-steel ropes and on many where fiber core ropes are now being used. Another of Herringbone's added attractions is the fact that it eliminates the necessity for stocking Lang lay rope for one job and regular lay for another.

Your Roebling Distributor has Herringbone right now. He has, also, copies of a brochure describing Herringbone, the newest Roebling Star Performer. If you wish, write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for literature and anything you'd like to know about Herringbone.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

HERRINGBONE
WIRE ROPE

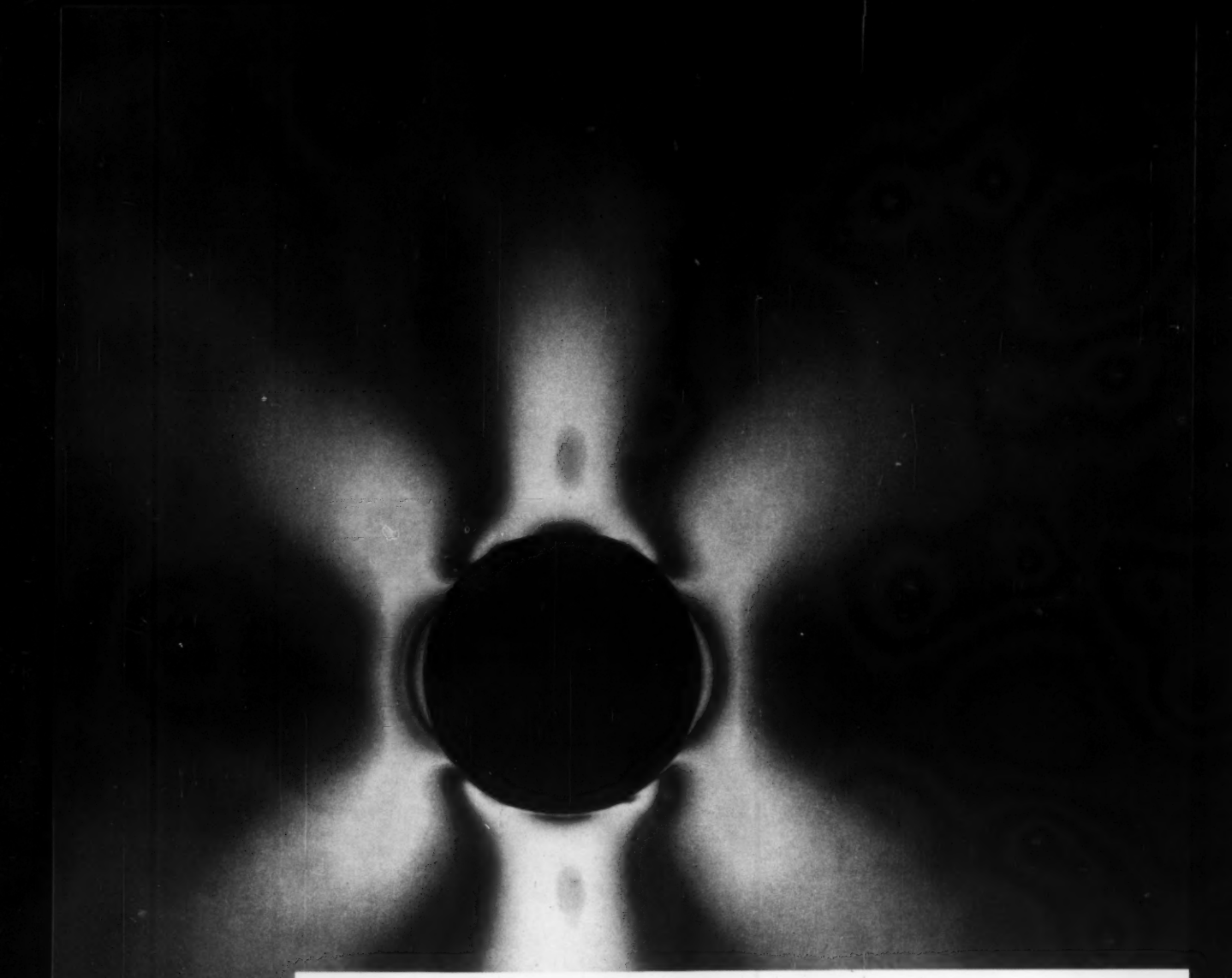


Photo-elastic stress patterns produced by models photographed with polarized light are one of the modern analytic tools available for ever-increasing perfection of Malleable iron castings.

Strength is Malleable

The strength crucial in spiraling the heave of diesels' pistons into unresistible power, in protecting lives as automobiles hurtle down endless highways, and in every link of chain that swings massive loads overhead, is yours to mold into tomorrow's dynamic engineering achievements with Malleable iron castings. Yet Malleable provides this strength in combination with toughness, producibility and economy that makes Malleable castings the finest, most versatile metal available.

For information or service, call on one of the progressive firms that identify themselves with this symbol—

MEMBER
MALLEABLE
CASTINGS COUNCIL

If you wish, you may inquire direct to the Malleable Castings Council, 1800 Union Commerce Building, Cleveland 14, Ohio, for information.

These companies are members of the

MALLEABLE CASTINGS COUNCIL

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
Terre Haute Mall. & Mfg. Corp., Terre Haute

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW JERSEY
Meeker Foundry Company, Newark 4

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Badger Malleable & Mfg. Co., S. Milwaukee
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

How to Get More Strength Per Dollar with Malleable Castings

With few exceptions, strength is the most important single design requirement for a metal part. But in the commercial production of that part, the ultimate objective is to manufacture it at the lowest possible cost. Malleable iron castings take advantage of many factors to provide the greatest strength per dollar of any ferrous or non-ferrous metal.

Great Strength Range Available

From the wide range of standard (ferritic) and pearlitic Malleable irons available, a type may be selected that meets strength requirements ranging from 50,000 p. s. i. to 120,000 p. s. i. tensile.

Table No. 1 shows these strength values and other physical measures for 9 grades of Malleable. Note particularly how high yield strengths are in comparison to tensile strengths. Because yield strength is generally the measure of usable strength, this is especially important.

Also important is the uniformity of Malleable's strength. The heat treatment given all Malleable castings produces a unique metallurgical combination of strength, ductility, machinability and impact resistance. At the same time, it relieves internal stresses so that Malleable's strength cannot be machined away, nor will it be present in some parts but missing in others.

TABLE No. 1
TENSILE PROPERTIES—
A.S.T.M. MINIMUM SPECIFICATIONS

Standard and Pearlitic Malleable Irons

Designation	Tensile Strength p. s. i.	Yield Strength p. s. i.	Ratio of Tensile to Yield %
Standard			
35018	53,000	35,000	66
32510	50,000	32,500	65
Pearlitic			
45010	65,000	45,000	69
45007	68,000	45,000	66
48004	70,000	48,000	69
50007	75,000	50,000	67
53004	80,000	53,000	66
60003	80,000	60,000	75
80002	100,000	80,000	80

Strengths up to 135,000 p.s.i. tensile and 110,000 p.s.i. yield are produced commercially under individual producers' specifications.

Economy Due to Multiple Factors

Malleable's superior strength-cost ratio is due to a combination of the casting process, which puts the metal where you want it, and the inherent economy of Malleable iron. Also, whenever machining operations are involved, Malleable castings cut finished costs significantly. Being the most easily machined of all ferrous metals of similar hardness, the cost of the finished part can often be reduced to less than that of metals which cost less in the semi-finished stage.

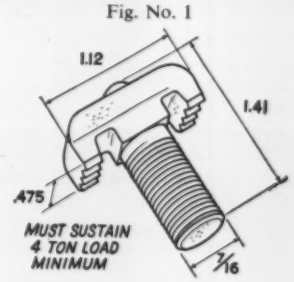
Malleable Provides Strength Plus Other Advantages

The T-bolt shown in Fig. 1 is used to assemble steel channel frames. Small but mighty, these 7/16″ bolts hold 4 ton loads. The tensile strength requirements are 90,000 to 100,000 p. s. i., yet ductility must be good and tolerances must be held to ±.005″ on the head width, and +.020″, —.000″ on the inside of the head.

In this application, pearlitic Malleable castings proved the only material consistently capable of sustaining loads over 8,000 pounds and meeting close tolerances in critical areas. At the same time, sufficient ductility was maintained to allow upsetting the spring retainer protrusion on the head.

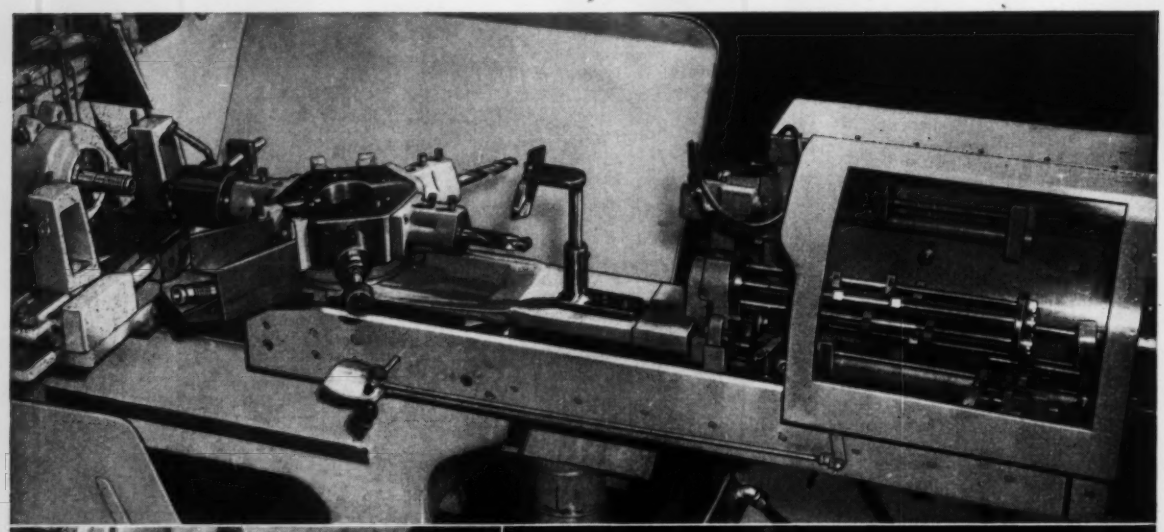
The finished Malleable castings cost one third less than the next most satisfactory material. For both dynamic and static applications, today's Malleable castings are truly one of industry's finest engineering materials.

Fig. No. 1



Write for Free Data Unit

Data Unit 102-Strength, more fully describing Malleable's strength characteristics, is available for use by materials specifiers and users. For your copy, contact any member of the Malleable Castings Council or write to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.



250% Production Increase with this setup

Gets full automation on small job-lot production runs using hydraulic drive on Gisholt Ram Type Turret Lathe

Floor-to-floor time on the job shown here—a threaded collar $3\frac{1}{8}$" long with $1\frac{11}{16}$" diam.—was cut from 8.1 minutes (with hand operation) to just 3.25 minutes. All operations and machine functions are automatically controlled with the Lynn Hydraulic Drive Unit on a Gisholt Ram Type Turret Lathe.

Here's how the finished workpiece is completely machined from bar stock in one fast, automatic operation: The stock is fed pneumatically against a turret stop, chucked, start-drilled, then finish-bored with a large drill. The hydraulic drive backs the drill out automatically to clear the chips, then rapid traverses back to where it left off before dropping into feed to resume drilling. Spindle speed automatically decreases as tools on the front cross slide form the O.D., drops into lower speed as O.D. is threaded, and into another low speed as radii are formed on the finished part and on the end of the bar stock. A tool on the rear cross slide cuts off the finished part and the job is done in record time.

With its massive design, reserve power and extra spindle speeds, the new Gisholt MASTERLINE Ram Type Turret Lathe is particularly adaptable to complete automatic operation with Lynn Hydraulic Drive. Contact your Gisholt Representative. He has the complete facts—and his wide experience may point the way to more profitable operation for you.

MASTERLINE GISHOLT SINCE 1887 GISHOLT

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

WRITE GISHOLT TODAY for all-new, 18-page illustrated Bulletin 1174-B covering features, accessories, tools and floor plans on new Gisholt MASTERLINE Ram Type Turret Lathes.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

COFFING
Quik Lift
Electric Hoist

20 Models in Capacities from ¼ to 2 tons

Workmen like the new Coffing Quik-Lift Electric Hoist because it is easy to operate and light to handle. The aluminum housing is in sections for quick access to change voltages, limit switch, type of suspension or chain. Moving the Quik-Lift from station to station in your plant is simple and fast. The pistol-grip push-button control station is made of non-conducting plastic. Its design permits up or down operation while pulling trolley mounted hoists. Power to the controls is reduced to 115 volts for added safety. For new hoist efficiency specify Coffing Quik-Lift. Your Coffing distributor has them in stock and will give you complete details, or write for Bulletin ADH-65.

DUFF-NORTON

- Pistol-Grip Push-Button Control
- Lightweight Aluminum Housing
- V-Type Brake for Maximum Braking Surface
- Easily Adjusted Limit Switch
- Complete Line of Accessories

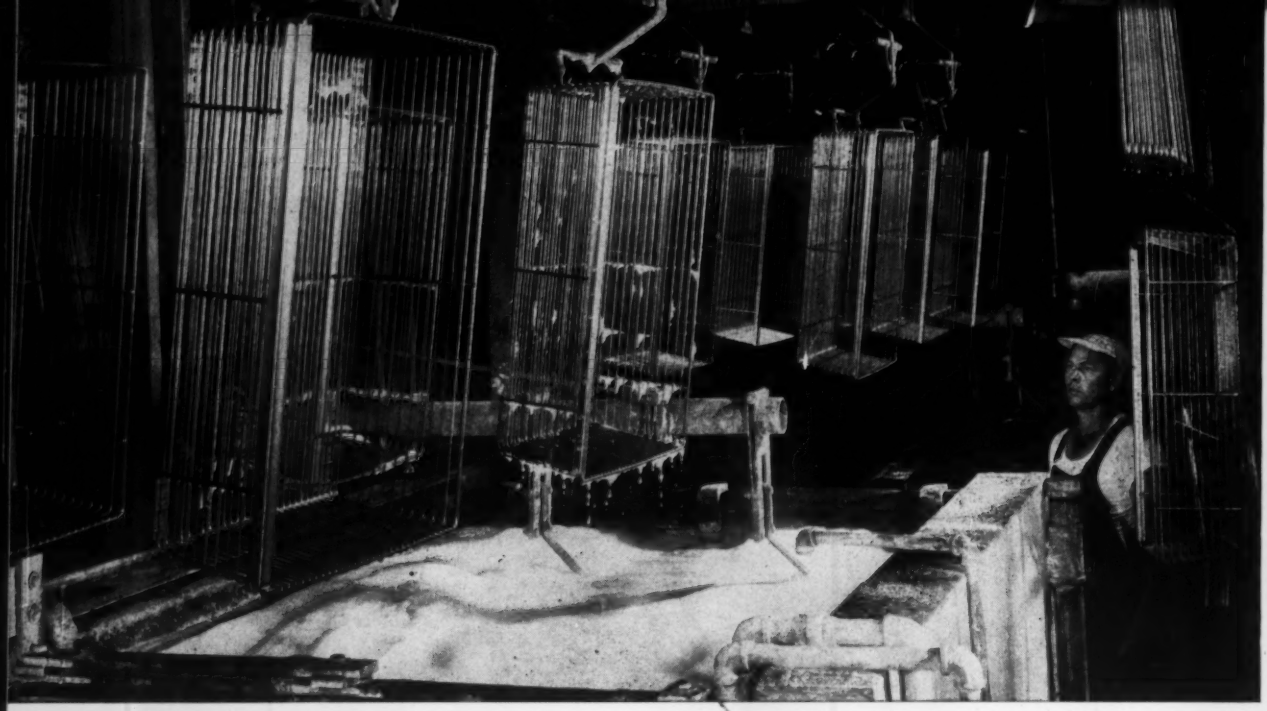
RATCHET LEVER HOISTS

SAFETY HOOKS

CHAIN HOISTS

COFFING HOIST

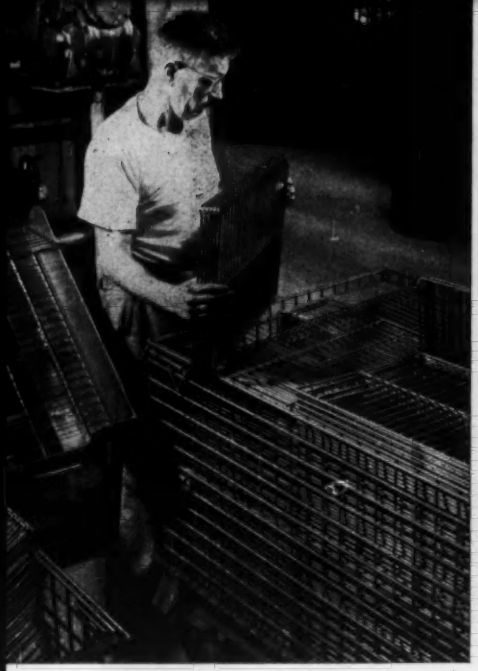
DIVISION OF
DUFF-NORTON COMPANY
[illegible] Wetter Street • Danville, Illinois



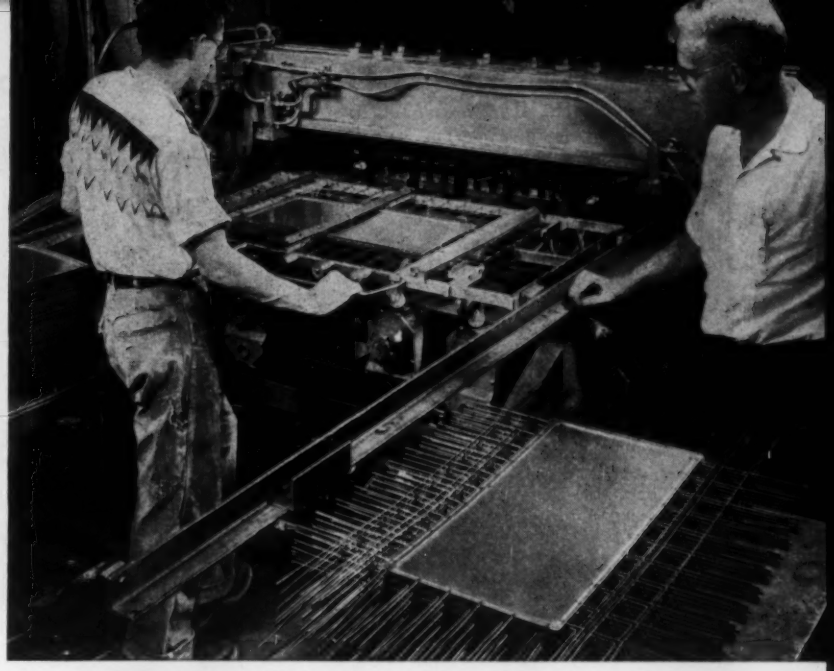
Baskets for a combination refrigerator-freezer enter plating line on conveyor. They are shown here leaving the first bath, an alkaline cleaner, and moving to a clear water rinse. A total of 15 immersions are given these baskets in the process of plating them with a .0005 inch coating of zinc. Below: The excellent surface required for plating is shown in the Pittsburgh Steel wire stockpiled at Bauer Bros. Co. in its Springfield, Ohio, wire division.

Bauer Bros. Gets Extra Clean Wire For Fully Automated Plating Lines

Defect-free Finish of Pittsburgh Steel Co. Wire Eliminates Costly Surface Preparation



This machine was designed and built by Bauer Bros. own personnel to speed the efficient production of racks, seen here coming off the end of the unit.



On this automatic multi-welder, design-specified by William Cannell, right, Bauer Bros. Co. master mechanic, a total of 288 different combinations of welds can be made. Here the operator is welding wire to a solid bottom basket for use by a major appliance manufacturer.

Bauer Bros. Co. demands, and gets, from Pittsburgh Steel Company extra smooth, clean, bright wire which can go into plating lines without any expensive surface preparation.

This is only possible with wire that has an extremely clean, defect-free surface.

Bauer Bros. Co. keeps its Springfield, Ohio, plant's automated plating line running smoothly with consistently excellent results.

The Wire Division of Bauer Bros. Co. fabricates wire shelves, racks and baskets for refrigerators, freezers, ovens and other appliances made by virtually every major appliance manufacturer.

Bauer Bros. buys coils of wire which it cuts into proper lengths, straightens and then forms into finished products on automatic shaping and welding machines, many of which were designed by Bauer Bros. personnel.

On these machines, Pittsburgh Steel's bright basic wire gets its first test. Good grain structure gives the wire ability to take severe bending without ripping or tearing. Uniform hardness from coil to coil and from shipment to shipment speeds production and holds down rejects.

• **Meets Customer's Demands**—On a completely automated plating line, Pittsburgh Steel wire meets Bauer Bros. demands for freedom from pits, seams and porosity.

So, Pittsburgh Steel wire helps Bauer Bros. Co. two ways:

1. More economical production on automatic machines and on plating lines.

2. Improved appearance of the final product adds to salability.

Bauer Bros. Co. can plate its wire products with any of these coatings: A combination of copper, nickel and chrome; zinc, clear or colored lacquer, and plastic (the new Corvel Fusion Bond process).

Products come to the plating line on an overhead conveyor directly from the Fabrication Department. Without any stops, the conveyor immerses products in a series of tanks on the plating line. In zinc plating, pictured here, baskets are dipped in a total of 15 tanks without a halt and without the intervention of a human hand. Drying and baking complete the plating cycle.

On these baskets, destined for use in a new combination refrigerator-freezer made by one of the country's largest appliance manufacturers, the zinc coating never falls below .0005 inch.

After plating, coatings are laboratory checked for porosity, density and resistance to wear and corrosion. In one test, products are enclosed in a salt air immersion chamber where temperature is maintained at 100 degrees F. and humidity at a sweltering 100 percent. A five percent salt solution gives the zinc a rugged workout.

Standards like these, rigidly maintained, call for the best in wire. The wire must be the ultimate in cleanliness, smoothness and uniformity. Pittsburgh Steel wire meets these specifications day in and day out.

Like Bauer Bros. Co., you also can get production economies and a more salable product from the use of Pittsburgh Steel's basic wire. Whatever you make from any type of manufacturers wire—from nails to precision springs—let a Pittsburgh Steel representative show you what Pittsburgh Steel quality and service can do for you. You can start benefiting today by getting in touch with the nearest district sales office.

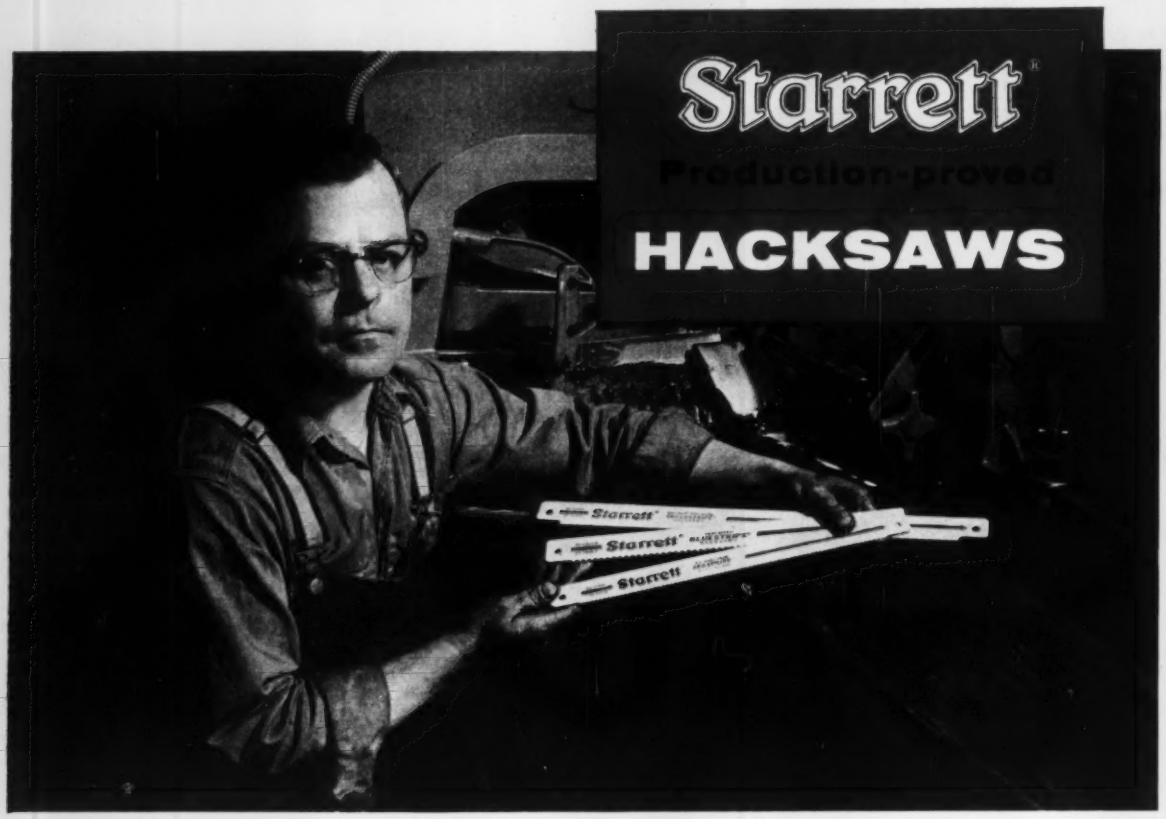
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

STARRETT PRECISION MAKES GOOD PRODUCTS BETTER



Named and color identified to help you specify the right blade for low cost, fast cutting, long life

Colorful hacksaw blades with easy-to-remember, colorful names — a plus value that makes Starrett Production-Proved Hacksaw Blades easy to specify and easy for shop men to identify.

Bright yellow blades with the *red stripe* are Starrett REDSTRIPE SM* High Speed Hand and Power Blades . . . extra tough, long-wearing special alloy high speed steel blades recommended for production work and run-of-the-shop jobs.

Yellow blades with the *green stripe* are Starrett GREENSTRIPE SAFE-FLEX* High Speed Hand and Welded Edge Power Hacksaws . . . shatterproof, unbreakable blades — *the safe* blades for heavy feeds, gang sawing and interrupted cuts.

Yellow blades with the *blue stripe* are Starrett BLUESTRIPE* High Speed Hand and Power Hacksaw Blades made of selected high speed steel especially heat treated for high speed production sawing and hard-to-cut metals.

Your nearby Industrial Supply Distributor has these Starrett Hacksaw Blades in a complete range of hand and power sizes. Call him for quality products, dependable service or send for Starrett Hacksaw Catalog which gives complete application data. Address Dept. BG, The L. S. Starrett Company, Athol, Massachusetts, U. S. A.

*Registered trade names

Starrett®

PRODUCTION-PROVED HACKSAWS

World's Greatest Toolmakers

Visit the Starrett Exhibit — Booth 632
Western Metal Exposition

STARRETT TOOLS

PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK • HACKSAWS • HOLESAWS • BAND SAWS • BAND KNIVES

BEND YOUR PROFIT CURVE UPWARD WITH "BUFFALO" BENDING ROLLS

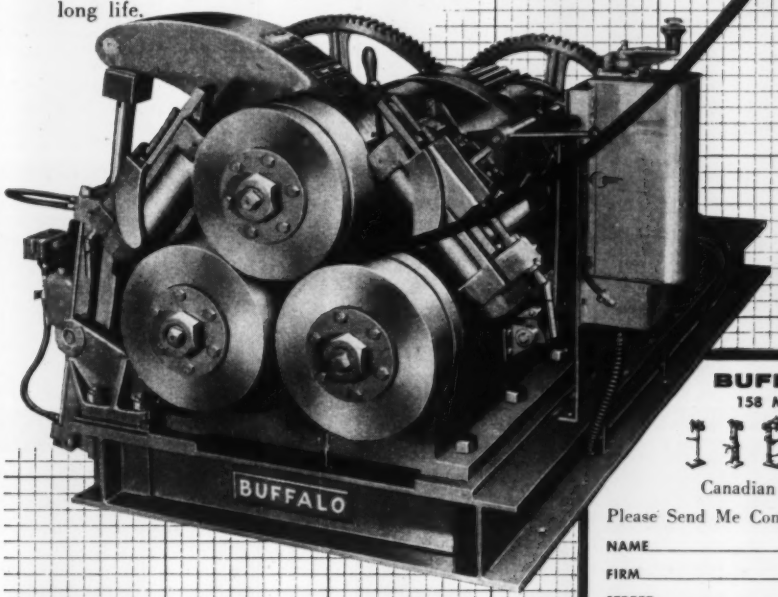
"Buffalo" Bending Rolls will cut costs, increase profits in your production bending operations because they're *fast, versatile, accurate.* Satisfied users report faster, higher quality output with fewer rejects.

Hundreds of shops, large and small, use them for rapid bending of circles, segments and spirals. Angles, rounds, squares, tubes, beams, channels, flats and many special shapes are handled with ease. Quick, easy roll changing for different structural shapes and sizes. Valuable setup time is saved by the "Buffalo" hydraulic top roll adjustment. With this, the upper roll is easily positioned or released in seconds.

Helping to speed operations is the exclusive "Buffalo" "Leg-In" Attachment. This simplifies bending of angles leg-in, formerly very difficult. Prevents material from twisting or getting out-of-square; also acts as a gauge when bending a run of circles to the same diameter.

"Buffalo" Bending Rolls are available in a number of sizes to handle all types of work, from small fabrication jobs to the heaviest applications. For full information, use coupon below — or call your "Buffalo" machine tool dealer.

All "Buffalo" Machine Tools bring you the extra "Q" Factor—the built-in QUALITY that provides trouble-free satisfaction and long life.



ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY
158 MORTIMER STREET • BUFFALO, N.Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Please Send Me Complete Facts on "Buffalo" Bending Rolls.

NAME_____ TITLE_____

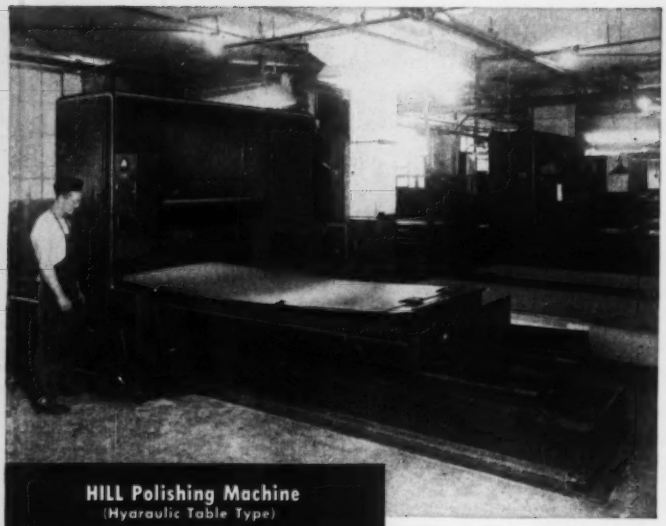
FIRM_____

STREET_____

CITY_____ ZONE____ STATE_____

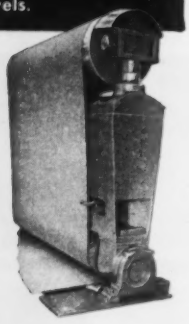
DRILLING PUNCHING SHEARING BENDING

HILL GRINDING AND POLISHING MACHINES
For FINISHING
Any and All
FERROUS and NON-FERROUS MATERIALS . . .



HILL Polishing Machine
(Hyaraulic Table Type)
For polishing individual sheets and plates. Hydraulic reciprocating table with centralized controls.

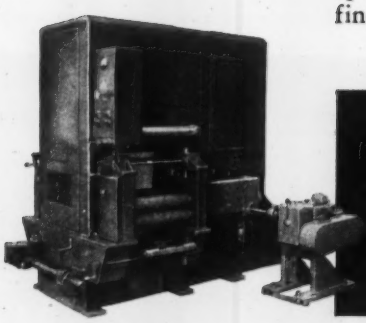
The basic HILL two-roll vertical head with upper steel idler roll and lower rubber covered contact or work roll (both dynamically balanced) over which the endless abrasive belt travels.



FLAT surfaces of ferrous or non-ferrous material can be brought quickly to the high finish so necessary for today's industrial and consumer products. The dairy, automotive, home appliance and engraving industries are typical of the wide range of application for these precise, labor saving machines.

HILL abrasive belt grinding and polishing machines are built in two general types. The hydraulic reciprocating table type polished individual sheets and plates. Table widths vary from 36" to 60". Table lengths range from 60" to 240". The Pinch-Roll type is for progressive line polishing. The HILL two-roll vertical head with endless abrasive belt is the basic principle common to both types.

When writing for information please indicate size and specifications of stock to be finished.



HILL Grinding and Polishing Machine
(Pinch-roll Type)
For pre-finishing, conditioning and polishing. Used as single units or in multiple units for progressive line polishing in wet or dry operations.

HILL ACME TOOLS FOR INDUSTRY

THE HILL ACME COMPANY

HILL DIVISION
ESTABLISHED 1882
1201 West 65th Street • Cleveland 2, Ohio

"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES

stainless strip—as you like it

Are your requirements for quality and finish in stainless strip being met? As Crucible makes it, it's rolled to your precise specifications—and produced with a finish that is truly lustrous. Not only that, Crucible ensures uniform metallurgical quality by methodically checking each heat—and makes certain of uniform gauge with electronic measuring controls on the most modern rolling equipment. Next time you need stainless, consider Crucible—a major producer of stainless in all gauges down to .010" and in all widths. Write to *Crucible Steel Company of America, Dept. S115, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

Fabricated PRECISION ASSEMBLIES

Formed, Welded and Machined by AMWELD®

An important segment of Amweld's subcontract work for the aircraft industry, and more recently for missile use, has been the production of welded precision assemblies. Special skills and techniques have been developed for forming, welding, and machining components . . . particularly those involving aluminum, titanium, stainless and similar heat-resistant alloys.

These special skills and facilities are available for subcontracting or experimental work. If you would like to obtain complete information on the capabilities of American Welding and how we can be of assistance to you — phone or write today. Our local representative will be happy to call and discuss your requirements.

Write for complete information.
NEW 20-page catalog of Amweld Rings, Bands, and Welded Assemblies.
NEW booklet entitled, "HOW AMWELD FLASH BUTT-WELDED RINGS ARE PRODUCED."

THE AMERICAN WELDING & MFG. CO.
110 Dietz Road • Warren, Ohio

AMERICAN WELDING

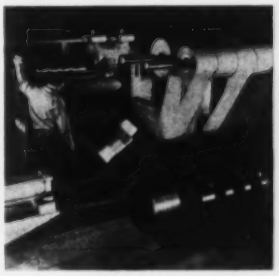
Part Prices Firm; Small Hikes Coming

You'll pay more for metalworking components after midyear than you do now. But most price increases will be small. In some cases, the only increase will result from curtailment of the price cutting that marked 1958. Customers are still "bargain hunting," but they're not getting the discounts they did last year. The second half of '59 promises to bring more price advances than the first. Probable average increase: 2 to 4 per cent (Page 45). If sales rise substantially, prices won't keep pace. Reason: Competition.

The Line-Up for Steel Labor Talks

There'll be two new faces on the steel industry's bargaining team when steel labor negotiations begin in New York City in May. Heading the industry negotiators will be R. Conrad Cooper, U. S. Steel's executive vice president—personnel services (taking the place of retired John A. Stephens). The other new face: H. C. Lumb, Republic Steel's general counsel. Returning veterans: R. Heath Larry of U. S. Steel and John Morse of Bethlehem. That first team will probably be backed up by representatives from nine other steel companies. Representing the union will be David J. McDonald, USW president, Howard Hague, vice president, and I. W. Abel, secretary-treasurer.

Sheets and Strip Vie for Markets



Producers of steel strip are fighting to recover markets they lost to slit sheets. Their ammunition: Strip offers precision, uniformity of thickness, and a good finish that sheets can't match. Where appearance sells the product, strip is making gains. The same applies where precision is critical. Conclusion: While sheets have made gains and the market is in transition, the market for strip is not about to vanish (Page 108).

What Labor Won in '58

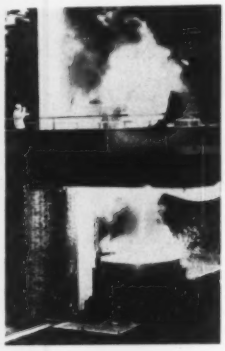
The median negotiated wage increase last year was 9.3 cents (vs. 10.3 in '57), reveals a Bureau of National Affairs survey of 4600 settlements in 32 industries. Metalworking breakdown: Aircraft and parts—13.3 cents; automobiles and parts—6.7 cents; electrical machinery—7.3 cents; iron and steel—7.8 cents; machinery (except electrical)—7.9 cents; nonferrous metals—7 cents; instruments—8.5 cents; transportation equipment—9 cents. In addition, 1 out of 4 metalworking settlements provides for deferred wage increases

and nearly 1 in 10 includes an escalator clause. Pensions figured in 18 per cent of the settlements, insurance in 36 per cent, and severance pay in 3 per cent.

Showdown Coming in Crafts vs. Industrials Feud

The cold war between craft unions and industrial unions of the AFL-CIO is getting hotter every day. Leaders of the crafts are planning an aggressive fight and have demanded a ruling from the AFL-CIO executive council before yearend. Some have threatened to secede if they don't get a satisfactory settlement. With new construction their only sure territory, the crafts are losing some jobs that are traditionally theirs, they say. Expect AFL-CIO brass to present a compromise plan soon—or the issue will explode at next fall's biennial convention.

Oxygen Steelmaking To Boom

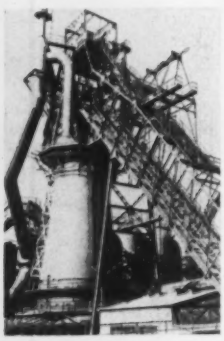


By 1965, oxygen converters will account for 25 per cent (about 45 million ingot tons) of the nation's steelmaking capacity and 35 per cent of foreign capacity, predicts Kaiser Engineers Div., Henry J. Kaiser Co. World oxygen steelmaking capacity is about 11 million ingot tons; by 1965, it'll be 120 million, Kaiser predicts. Last week, Kaiser Steel Corp., Fontana, Calif., poured the first official heats from three new oxygen furnaces. Capable of turning out 1,440,000 tons, they doubled Kaiser's capacity (Page 88).

In Bridgebuilding, Steel Girds for Aluminum Onslaught

Steel is combating aluminum's threat as a bridgebuilding material. The American Institute of Steel Construction is promoting design standardization to lower the cost of steel highway bridges. Steelmakers have boosted structural shape capacity to 8 million tons—almost 3 million above their average annual shipments during the last five years. The federal highway program will take 1 million tons this year.

Finsider Bids for World Steel Markets



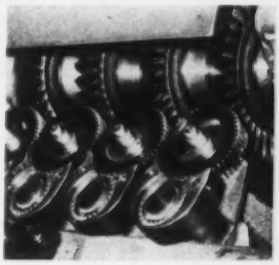
World competition is the aim of Italy's iron and steel giant. Finsider has tripled production since 1950 through a five-year plan that bears examination (Page 59). Rising from the rubble of World War II to score gross sales of $600 million in 1957, it now produces more than 80 per cent of Italy's pig iron and more than half its crude steel and hot-rolled products. The European Common Market dovetails with Finsider's plans for capturing markets as it develops a steel industry unsheltered by the government. About 55 per cent of the firm is privately owned.

Footnote to Nuclear Attack

If a city were hit by a 10 megaton nuclear surface burst, it would take 75,000 men nearly a month to decontaminate the area for rescue and rehabilitation work. Clearing the streets would require 1200 power shovels, 1200 draglines, 2000 bulldozers, 1000 trailers, and 7000 trucks. Five billion gallons of water would be needed. That's what Maj. Gen. E. C. Itschner, chief of engineers, U. S. Army, told the Associated General Contractors' annual convention.

Power Brushes Find More Jobs, Come in Great Variety

Metalworking plants are finding many new jobs for power brushes. They deburr, clean, blend edges, condition surfaces. They're finding a promising new territory in decorative finishing. And they're being used to produce a surface that will promote adhesion. Available in a wide variety of materials, shapes, and sizes, choosing the right one is important (Page 80).



Utilities To Boost Capital Spending

About 14.4 million kilowatts of capacity will be added to power systems this year (vs. 14 million in '58 and 12.5 million in 1955), estimates Edison Electric Institute. The American Gas Association predicts '59 outlays for gas transmission, distribution, and storage facilities will hit $1.7 billion to $1.8 billion. It expects $8.1 billion to be spent during the 1958-61 period (vs. $5.7 billion during the 1954-57 period).

Shopping for an Incentive Plan?

Incentives for hourly workers offer great potential—if you're willing to pay the price. The potential: Productivity gains up to 50 per cent; substantially lower unit costs. The price: An increase of perhaps 20 per cent in wage costs and a constant battle to keep the program from going sour. Loose standards are a common cause of that. It's important to pick the type of plan that best fits your operation and objectives (Page 52).

How To Get Up Late for an Early Appointment

A passenger airplane designed to fly at twice the speed of sound could be ordered today for 1965 delivery—but such a plane will probably never be built. Transports flying at three to five times the speed of sound, available by 1970, are a much more likely prospect, believes R. C. Sebold, vice president-engineering, Convair Div., General Dynamics Corp. He doesn't think

an airline would finance Mach 2 equipment on the strength of a five-year advantage. The Mach 3 to 5 transports would have operational lives of 15 to 20 years and offer tremendous advantages. Example: A New Yorker could leave his Long Island home for a 9 a.m. appointment in Los Angeles a half hour later than he would normally leave for his desk in Manhattan.

Ultrasonics Moves into New Areas, Old Uses Expand

Watch for industry to find even more uses for ultrasonic energy—in cleaning, machining, fabricating, inspection, and gaging. Some present uses might indicate areas where you can put it to work (Page 48). Pilot testing is underway to develop sound energy for degassing, etching, galvanizing, pickling, and scale removal. Its use for welding is gaining popularity. Makers of ultrasonic equipment expect their sales to metalworking this year to climb to a record $35 million—more than double the '56 volume.

Titanium Demand Turns Up

Titanium producers expect a substantial increase in sales this year. Mallory-Sharon Metals Corp., for example, is budgeting '59 sales at $18 million, vs. $13 million last year. Two reasons for the upturn: 1. Price has declined. Rods now sell for $3.50 a pound, vs. $5.50 a year ago. 2. A booming market has opened up in commercial jet aircraft. The Boeing 707 contains 1000 lb; the Convair 880 and the Douglas DC-8 each use 2500 lb.

How To Swim into a Market

In your quest for new markets, don't overlook the swimming pool industry. It chalked up record sales of $600 million last year and may hit $700 million this year, predicts *Swimming Pool Age*. Less than 5 per cent of the 51,200 pools built last year were metal; 85 per cent were concrete; about 10 per cent were vinyl lined. About two-thirds were the backyard type—at an average price of $4170.

Should You Pay Employees for Jury Duty?

A National Industrial Conference Board survey indicates that 6 in 10 companies have specific plans to guard supervisors against personal loss while serving as jurors; some others pay without having a formal procedure. About 53 per cent of hourly employees get that coverage. In most cases, salaried employees keep jury fees in addition to their regular pay while the fees are deducted from the pay of hourly workers.

Straws in the Wind

Auto buying was the major factor in December's $306 million hike in consumer credit—the biggest monthly increase in two years and nearly double the November rise . . . Steel imports rose 30 per cent last year to 1.7 million tons while exports declined to 3.4 million tons, vs. 5.8 million in '57, estimates Roger M. Blough, chairman, U. S. Steel Corp.

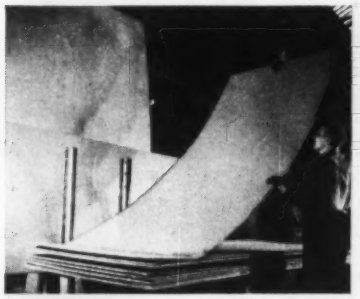
STAINLESS DIRECTORY

Buyers Guide to Ryerson Stainless Stocks & Services

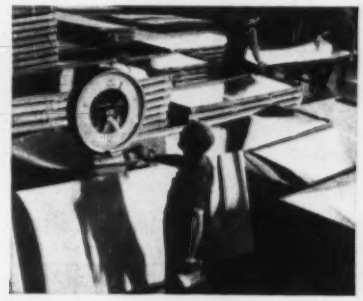
Here's a quick guide to the nation's largest stocks of stainless steel—2,351 sizes, shapes, types and finishes of stainless in stock at Ryerson.

This wide selection assures you of getting the best stainless for every application. Extra care in storage, handling and shipping—such as padded shear clamps to protect finish and flatness of sheets, guards the high quality of Ryerson stainless stocks. And in addition, the help of full-time stainless specialists is yours when you call Ryerson.

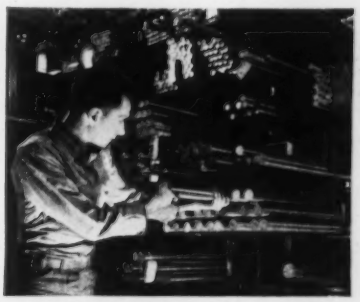
See your Ryerson catalog for a complete listing of stocks and call your nearby Ryerson plant for quick shipment of stainless—any type or size—one piece or a truckload.



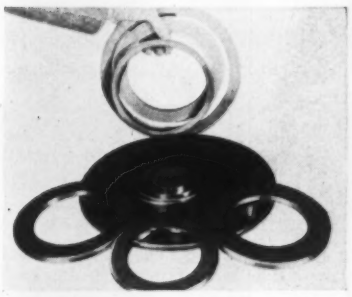
PLATES—Available in 9 analyses including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also low carbon types for easy welding.



SHEETS—11 analyses of Allegheny stainless sheets in stock including nickel and straight chrome types. Also extra wide sheets to reduce welding costs, expanded and perforated sheets.



BARS AND ANGLES—Rounds, squares, flat's, hex's and angles in 8 types including free-machining bars with both analysis and mechanical properties controlled.



RINGS AND DISCS—Machine cut to your order. This service assures size accuracy, smooth edges, flatness and unaffected corrosion resistance in a lower-cost, ready-to-use product.

HEADS—A.S.M.E. flanged and dished heads in types 304, 304L, 316 and 316L are on hand in large quantities, and in a wide range of gauges and sizes.

PIPE AND TUBING—Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also screwed type and welding fittings and Cooper stainless valves.

I·V·B·M
Increased Value in Buying Metals
Ask about this Ryerson Plan for 1959

RYERSON CERTIFIED QUALITY

RYERSON STEEL®

Member of the INLAND® Steel Family

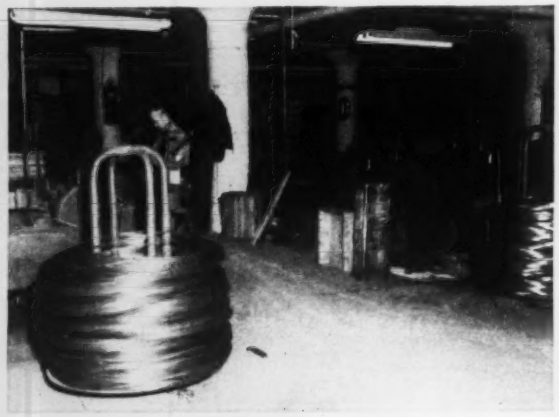
Principal Products: Carbon, alloy and stainless steel — bars, structurals, plates, sheets, tubing — aluminum, industrial plastics, metalworking machinery, etc.

PLANTS AT: NEW YORK · BOSTON · WALLINGFORD · PHILADELPHIA · CHARLOTTE · CINCINNATI · CLEVELAND · DETROIT · PITTSBURGH
BUFFALO · INDIANAPOLIS · CHICAGO · MILWAUKEE · ST. LOUIS · DALLAS · HOUSTON · LOS ANGELES · SAN FRANCISCO · SPOKANE · SEATTLE

DSC-Portsmouth Long Production Run

LPR COILS AT WORK

Helping Bright Wire Fabricators Reduce Man-Hour Costs



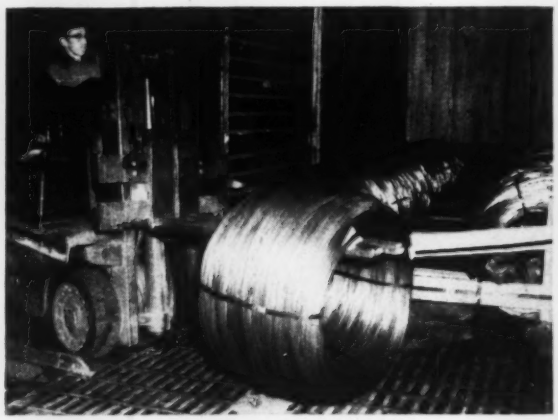
A Section of the Straightening-and-Cutting Department of a DSC Customer's Bright Wire Fabricating Plant.

THIS SCENE looks familiar but it really isn't. What makes the difference? Those two big coils feeding the straighteners-and-cutters. They are LPR's. When shipped, each weighed 1800/2000 pounds in a single length of wire. Not shown in the picture are the other two machines in this setup—all four of them run by the lone operator. Best previous operation here with 600 pound coils was one man, three machines. *That's an improvement of 33⅓% in machine utilization alone. Now using LPR's on 75% of his requirements, this customer reports a 15% drop in overall man-hour costs. Other users report savings of 20%.*

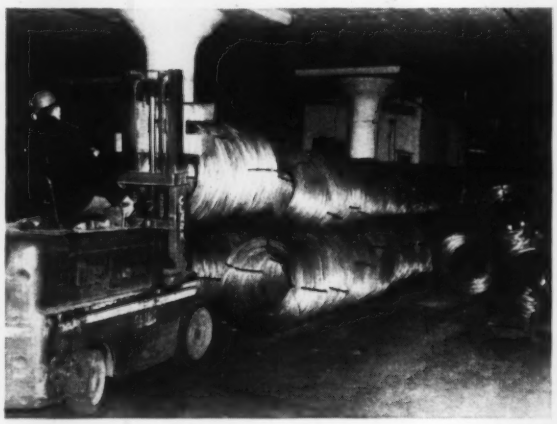
FURTHER LPR BENEFITS AS REPORTED BY OTHER USERS

"Unloading time cut in half" . . . "15% savings in storage space" . . . "Quit using small-coil racks" . . . "Eliminated all returnable reels and platform carriers" . . . "Cut coil remnant scrap losses 90%" . . . "Greatly improved inventory control" . . . etc., etc.

Like to see what LPR's might do for you? Just call your nearest DSC Customer "Rep" or write us at Detroit.



Average unloading time of boxcars containing 600 pound coils, 1½ hours; with 1800/2000 pound LPR's, now averaging 1¼ hours . . . saving 15 minutes per car, or 16%.



Possessing much greater density (weight per cu. ft.) LPR's stack and store more compactly; handle safer, faster. Self-supporting LPR's won't kink, tangle or topple in transit, in stock or in fabrication.

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:
Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio, Dayton, Ohio, Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Houston, Texas, Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York City, Rochester, N. Y., St. Louis, Toledo, Worcester, Mass.

The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric

© DSC 1959

How To Be a Better Manager

Francis M. Rich, vice president of Inland Steel Co., recently expressed his philosophy of management to a group of young men about to enter the business world. (They're members of Sigma Iota Epsilon. The national management fraternity presented an honorary membership to Mr. Rich.) We think his message deserves wider circulation.

The principal goal of business is to make a profit, he said, but there is another fundamental fact so often taken for granted that it is almost forgotten: The American system of private, competitive enterprise is a loss system as well as a profit system. If a company is poorly managed, it can even go out of business.

Making a profit isn't enough either. A business has to make a profit over the long haul and must regulate its affairs to guarantee that it does so.

Any given enterprise can have the best workers, materials, capital, and plant facilities, but it is doomed if it doesn't have proper management leadership.

The most important steps in insuring the perpetuation of a company are the proper selection, development, organization, and motivation of managers.

The best way for these men to learn to be good managers is to manage—that is, get on the job and assume responsibility under the guidance of a man who has learned his art by practicing it.

But that is not enough. At Inland Steel, men are promoted into management ranks only after careful consideration of character, attitude, ability, experience, performance, and job knowhow, as well as moral, mental, emotional, and physical fitness.

At the top of the list is character, which includes integrity, loyalty, courage, unselfishness, reliability, and kindness.

The ranks of management need men who have the courage to explain their ideas to their boss even when they conflict with policy. A boss needs men who will tell him when they think he is wrong.

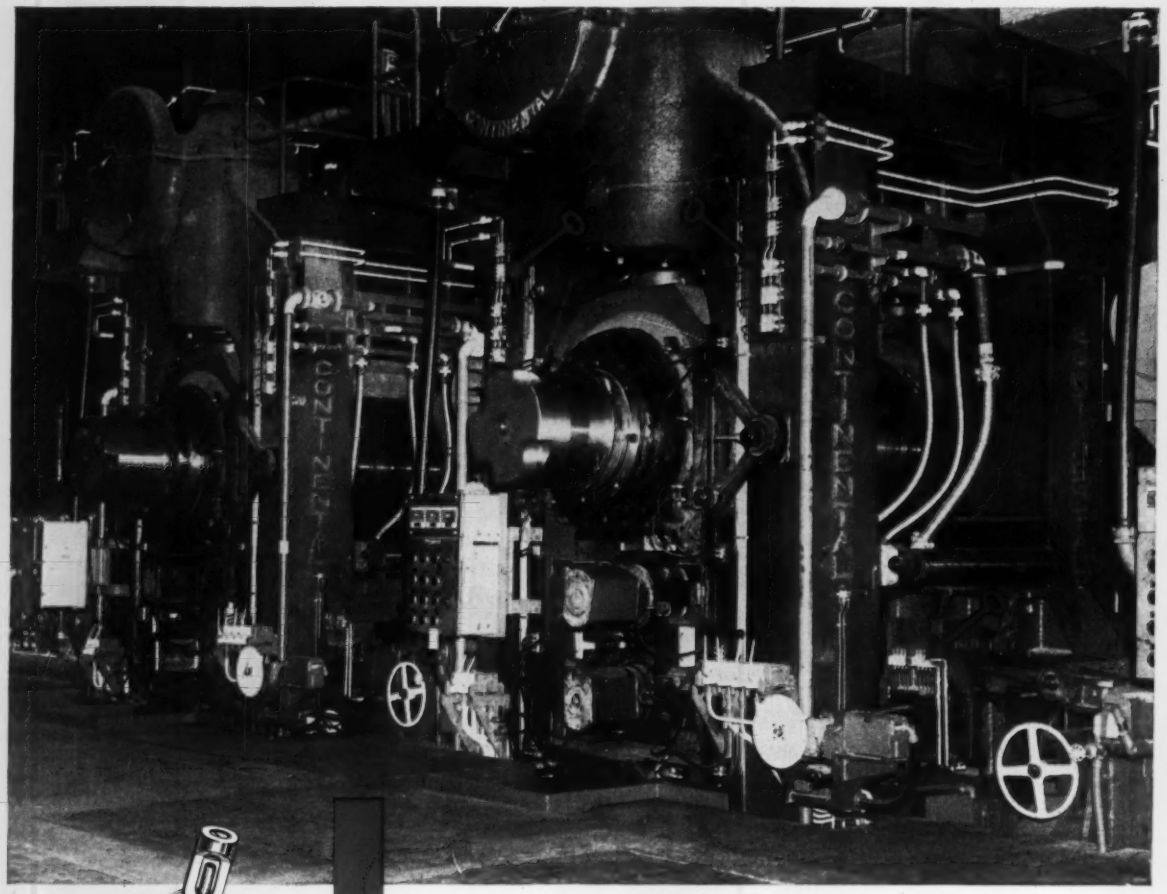
The ranks of management do not need "yes" men and apple polishers. They're a liability to an organization.

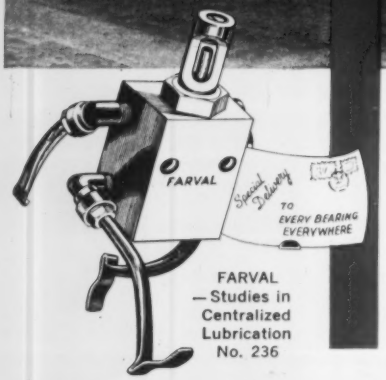
To Mr. Rich's conclusion that the capability of management is the most important single factor in securing the greatest possible profit over a long period, we can only say:

Amen!

Irwin H. Such

EDITOR-IN-CHIEF





FARVAL
—Studies in
Centralized
Lubrication
No. 236

On new Hot Strip Mill, 10 Farval Systems protect 2023 vital bearings!

Bearing failure on this modern 5-stand, 54-inch semi-continuous hot strip mill will never be a problem. Mill operators know burned-out bearings can stop valuable output, sky-rocket production costs, idle expensive mill crews.

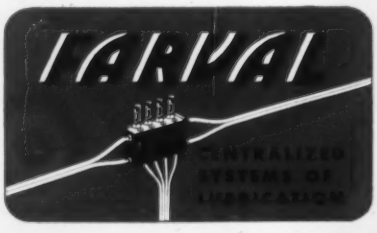
But thanks to 10 Farval lubricating systems—designed-in by the mill builder—this new production unit will feed measured amounts of the proper lubricant to all vital bearings while rolling strip at 2000 fpm. Nine of the systems are motor-driven, time clock controlled setups; one is manual—all operated from centrally-located pumping stations.

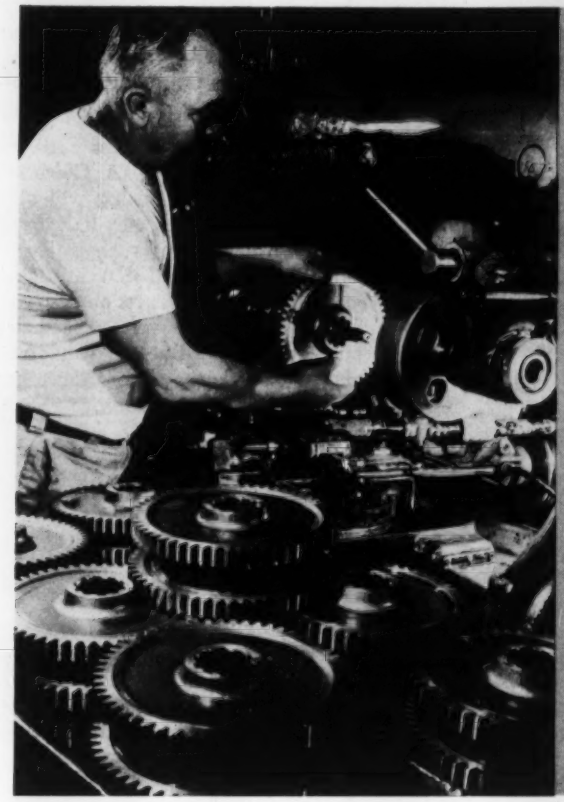
Remember, any type of Farval Centralized Lubricating System can be easily installed on either old or new industrial machinery. Let our engineers give you the "Farval Story" today—it will pay dividends in more productive equipment. Ask for free Bulletin 26-S. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know steel mill equipment is being properly lubricated.





First Half Price Trend

Gray iron castings—No appreciable increase.

Diecastings—Stability.

Stampings—Spotty hikes of 5 to 10 per cent.

Forgings—Less shading, more stability.

Fasteners—A 4 to 7 per cent hike near midyear.

Screw machine products—Stability.

Electric motors—Relative stability.

Gears—Price cutting will diminish.

Relays—Stability.

Antifriction bearings—A 5 per cent increase.

Springs—Firmness, with a few small hikes.

Part Prices Firm; Small Hikes Ahead

IF YOU BUY components, here's good news: Prices will be relatively stable through the first half of 1959 and probably all year.

• **The Pattern** — You can expect sporadic hikes in the first half. More will come later as metalworking suffers higher labor and material costs. Increases will be modest. Probable average: 2 to 4 per cent.

If you're a partmaker, you'll find it difficult to push through any substantial raise. But you may realize higher prices because the price slashing that marked 1958 seems to have about run its course. Customers are still "bargain hunting," but they're not getting big discounts.

• **Phenomenon of the '50s**—Even if sales rise substantially, prices won't keep pace. Reason: Competition. Problem: Ability to produce far exceeds demand (see examples on Page 46). So customers resist hikes knowing that overcapacity keeps competition intense and that many suppliers will whittle figures. The lag in part prices is contributing to the rosy profit outlook for some industries (Page 54).

Here's what to expect in 12 major component industries:

Gray Iron Castings

• **Prices Down**—It's been 18 months or better since the average foundry dared to up quotations. Last year, sales dropped and prices skidded as foundries fought bitterly for the available business.

Chances are slim for any appreciable price boost soon. The picture could change quickly if material costs go higher as the result of a new wage spiral. But, as one New York foundryman puts it: "Once prices go down, it's damn near impossible to boot them back up in a short time."

• **What To Expect** — A Chicago maker says: "To catch up, we need to boost prices by at least 10 per cent." That won't happen, but expect a virtual end to price shading and relative stability with an outside chance of hikes averaging 3 to 5 per cent late in the first half.

Nonferrous Castings

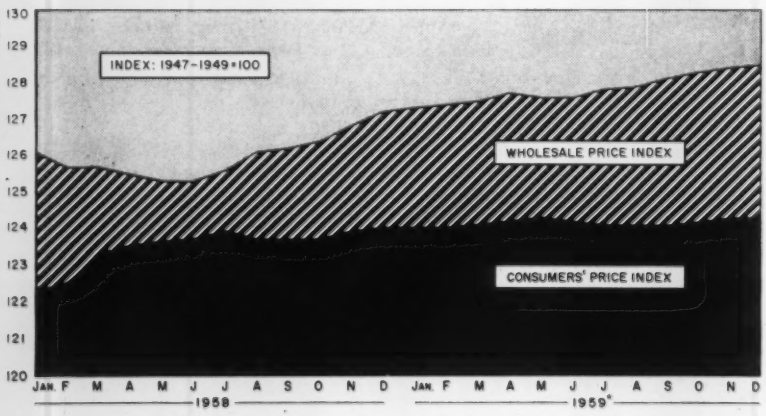
• **Still Slow**—Sales have improved but the pickup is strong only among

Ability To Produce Outraces Demand . . .

(Operating rates as per cent of capacity)

SELECTED INDUSTRIES	1959	1958	1957
GRAY IRON FOUNDRIES	74	64	78
(Based on "maximum commercial demand." Definition: The industry's shipments during 1951's first half. Source: Gray Iron Founders' Society.)			
STEEL FOUNDRIES	58	40	70
(Based on "maximum commercial demand." Definition: The best six months each member foundry has had since World War II. Source: Steel Founders' Society.)			
MALLEABLE FOUNDRIES	64	54	69
(Estimated by STEEL.)			
SCREW MACHINE PRODUCTS	53	47	58
(Based on capacity in terms of maximum machine hours available. Source: National Screw Machine Products Association.)			
DROP FORGINGS	—	51	78
(Index: 1955 = 100. Source: Drop Forging Association.)			

So Prospect Is for Fairly Level Prices



Source: U. S. Bureau of Labor Statistics.
*Estimated by STEEL.
Wholesale price index covers all commodities but farm products and food.

firms making specialized products where competition is not so keen. They pushed through a few increases during 1958, but most foundries were plagued by price shading (some estimate that only 1 in 10 foundries made money last year).

• **Coming Up**—Expect less cutting in the months ahead. A Chicago maker says: "Price cutting will always be around in our industry; that's why we have such a high mortality rate." But that attitude may be changing. Asserts an eastern foundryman: "If we wanted to keep busy, we could. But we wouldn't make a profit on much of the work. So we'll try to hold the price line."

• **Summing Up**—Some price shading, more stability, a general increase unlikely.

Diecastings

• **Bouncing Back** — Industry sales took a sharp upturn in 1958's fourth quarter after a slump in the first three periods. Expectations are that 1959 will be a much better year.

• **Price Pattern**—While a few makers held the line in 1958, most saw their quotations dive. The average: 10 per cent. Intense competition probably rules out recouping to any appreciable extent.

• **What Next?** — Prices shouldn't drop any more in the first half. There's an outside chance for an across-the-board boost late in the year.

Stampings

• **Price Fighting** — Prices were jumped an average of 4 per cent by most makers around this time last year. Since then, competition has forced quotations down by 10 to 15 per cent. Says a Michigan stamper: "We've been fighting to survive and taking business at any price to keep our doors open."

• **A Look Ahead**—Price fighting has just about run its course. Sales are up an average of 10 to 15 per cent, blunting somewhat the competitive edge.

• **Will Prices Move?**—Odds favor

some spotty hikes averaging between 5 and 10 per cent during the first half. Other makers will follow suit in the second half if business continues to improve.

Forgings

• **Officially Higher, but**—The price lists show that forging prices advanced 4 to 5 per cent last year. Unofficially, it was a "dog-eat-dog" affair with price slashing common.

• **Recovering**—A New York forger describes price cutting in 1958 as "murder." He adds: "But we're starting to up quotations to 'realistic levels' (6 to 7 per cent higher than six months ago)."

• **On the Rise?**—Business has improved enough that there's strong talk of a price rise. Look for stability during the first half, a modest increase soon after midyear.

Fasteners

• **Worst Has Passed**—During the height of the recession, fastener prices dropped as much as 20 per cent. Two reasons: 1. Intense competition after a severe order decline. 2. Mounting imports undercutting domestic prices 10 to 40 per cent.

• **Sales Up, but**—Says a midwest maker: "Sales turned up this fall and it's not too tough to get volume. It's making a profit that's hard."

• **Future**—Expect stability for the greater part of the first half. The only factor strong enough to trigger an early hike would be higher steel extras, which is unlikely. In the late spring, automakers hand out major component purchase commitments. Fastener makers may try for an incerase then. They would like a 10 per cent boost but will probably settle for 4 to 7 per cent.

Screw Machine Products

• **Getting Less**—Price slashing plagued the industry during most of 1958. Some automotive items reportedly are still going for less than they did four years ago, although prices generally have firmed. Typical is the New York company that reports prices have been eased back to "near normal"—a gain of 15 per cent from the recession low.

• **Problems**—Many makers have a lot of orders, but they're often small ones that necessitate costly downtime. Sums up one manufacturer: "We look for a 15 to 20 per cent sales gain in 1959 but no profit improvement."

• **Outlook**—The industry will absorb first half wage hikes. It hopes to push through a price boost this summer to cover expected steel increases.

Electric Motors

• **Fractional**—Prices fluctuated wildly in 1958. At yearend, they were down an average of about 5 per cent from those of 1957. Reason: Intense competition and weather conditions which cut into air conditioner and fan sales. Higher labor and material costs will bring stability, and maybe a slight boost, in the first half. Another slight rise may come in the fall.

• **Integral**—Price cutting was particularly vicious early in the year when some lines were cut 6 to 17 per cent. In general, alternating current motors suffered most; direct current units pretty much held their own. The wave of slashes has stopped. Expect price stability through the first half. In the fall, look for 3 to 5 per cent increases in certain lines.

Gears

• **Rugged 1958**—Excess capacity and an industry-wide sales drop of better than 20 per cent forced unofficial price shaving, averaging 10 to 15 per cent.

• **More Fluctuations** — Prices are still unstable. Customers do a lot of shopping around and dickering before they order.

• **Preview**—Don't look for any formal increases in the first half. Most makers hope charges will be "close to present published prices." If steel prices go up more than $5 a ton, look for a rise of 3 to 4 per cent in midsummer.

Relays

• **Prices Weak**—Officially, prices remained firm last year; many makers haven't announced an adjustment since early 1957. Unofficially, price cutting has gone on for more than a year. "Some people who are shading quotations never did it before," reports a northern firm.

• **What Will Happen**—Even companies expecting sharp sales gains don't think they can hike quotations without losing business. Expect stability throughout the year.

Antifriction Bearings

• **Stable** — Bearings haven't been subject to a major price change for about a year. There were one or two attempts to jack up quotations in 1958 but competition soon forced the raisers back down. There hasn't been much shading; prices generally stand about where they were a year ago. Nonferrous engine bearings, though, fluctuate with metal prices.

• **Forecast**—The recession stiffened competition, forcing absorption of labor and material cost increases. Better business will soon bring capacity utilization to a satisfactory level, say industry people. They believe: Prices will rise about 5 per cent during the first half with odds 50-50 for another increase later in the year. Miniature bearings may go up 5 to 10 per cent in the second half.

Springs

• **Prices Up** — Most springmakers raised prices an average of 3 per cent in November. A few cut them back when customers objected, but others are holding the line.

• **Stability**—Look for 1959 to bring greater stability. A few makers predict a rise of 2 to 3 per cent, but most think tags will not change.

Summary

Component buyers will pay higher prices after midyear than they're paying now, but the hikes won't be large. In some instances, upward revisions will merely mark the end to widespread price shading.

Branson Ultrasonic Corp.

Final assembly readies this group of transducers for installation in a machine for the continuous cleaning of bearing components

Busiest Metalworking Year Ahead for Ultrasonic Tools

INDUSTRIAL USE of sonic and ultrasonic energy for cleaning, machining, fabricating, inspection, and gaging is undergoing a tremendous growth. Equipment makers expect sales to metalworking in 1959 to reach a record $35 million.

• **Sales Breakdown**—Of the total, $9.5 million worth of equipment will be used to clean material for plating and finishing, $6 million for inspection, including flaw detection and gaging, $2.4 million for industrial drilling, $2.7 million for liquid level sensing, $3 million for remote controls for television receivers. Miscellaneous operations will account for $11.4 million.

Since 1956, dollar value of ultrasonic equipment has more than doubled (see table).

Small pieces of equipment are powered by single 50 watt generators. Large systems require several generators (2 to 5 kw). Materials cleaned by the process range from small precision bearings to large shapes.

• **Producers**—There are about 35 manufacturers of all types of sonic equipment.

Of that number, about 12 build ultrasonic cleaning units, five machining apparatus, four soldering and welding machines. The remainder design and build special units, from medical therapy systems to sonic oil well drills.

Largest expenditures, by far, in 1959 and succeeding years, will be for cleaning equipment in electronics, missiles and aircraft, nucleonics, and metal finishing.

Says H. F. Osterman, sales manager, Branson Ultrasonic Corp., Stamford, Conn.:

"The rate of application of ultrasound in industry has been controlled by equipment limitations; whenever a technological breakthrough occurs in the development of equipment, new applications are immediately found.

"An example of this was the advent of the stainless steel-clad ceramic transducer. Prior to that time, barium titanate could only be utilized in nonconducting solutions such as distilled water or trichlorethylene. This limited the application of ultrasonic cleaning primarily to degreasing operations. The clad transducer has made possible a major portion of the ultrasonic cleaning installations in use now."

• **Installation**—At least one continuous strip installation will be completed by late 1959 or early 1960, and several firms are hopeful of applying ultrasound to continuous pickling and cleaning of strip and wire. Pilot scale tests are being run to obtain economic and engineering data; advantages are cleaner material, higher production rate, and shorter lines.

In production of dies and special cutting tools, use of ultrasonic machining will be expanded; its major advantage is ability to cut complicated holes and extremely hard material. With the exception of metal finishing, greater use of ultrasonic cleaning is dictated by rigid cleanliness requirements. In addition to quality advantages obtained, greatly increased production

Metalworking Uses for Ultrasonics

Status

Lab	Pilot Scale Testing	Commercial Use	
X			Anodizing
		X	Degreasing
		X	Cleaning extrusion dies, wire-drawing dies
	X	X	Deburring
	X		Degassing of molten metals, grain refinement
	X		Electropolishing
	X		Etching
	X		Hot dip tinning (better adhesion)
	X		Galvanizing (better adhesion)
		X	Machining: Drilling, cutting, blanking, grinding, routing, engraving of hard metals, glass, & ceramics, cutting of dies
	X		Pickling, scale & oxide removal
		X	Plating
		X	Soldering & brazing: Metals "difficult" to join, such as aluminum to aluminum or to stainless steel, are soldered without flux
		X	Welding: Foil & sheets are welded to heavier sections without heat. Flux removed from many delicate welding operations
		X	Testing: Nondestructive testing for metal flaws. Effective even in several feet of metal
		X	Thickness testing
		X	Lamination bond testing
		X	Coating thickness testing (films, coverings)

rates or reduction in manhours required in cleaning usually results.

• **Welding Tool** — Acceptance in welding is gaining. Ultrasonic or cold welding is being utilized to join dissimilar metals of different properties, gages, and melting points. Example: Welding aluminum foil to heavy gage steel.

Continuous-seam welding of structural aluminum alloys is feasible, and ultrasonic welding is producing spot type, solid state joints in aluminum alloys: 1100-H14, 2024-T grades, and 7075-T6 Alclad. These welds meet shear strength requirements of military specifications for resistance spot-welds in 0.081 in. and 0.051 in. sheet thicknesses. The joining process is effective at temperatures below critical levels for aircraft structural aluminum alloys.

Although the potential for ultrasonic energy is large and the uses many, Mr. Osterman warns that extensive testing and evaluation are necessary prior to the final design when new sonic processes are contemplated.

• **Unit Size Up**—Narda Ultrasonics Corp., Westbury, N. Y., cites spectacular growth in the field of cleaning, notably preparing metal and plastic parts for plating and other finishing operations. The firm, a little over a year old, had a sales volume last year of $2,350,000. The company estimates its 1959 volume will reach $5 million.

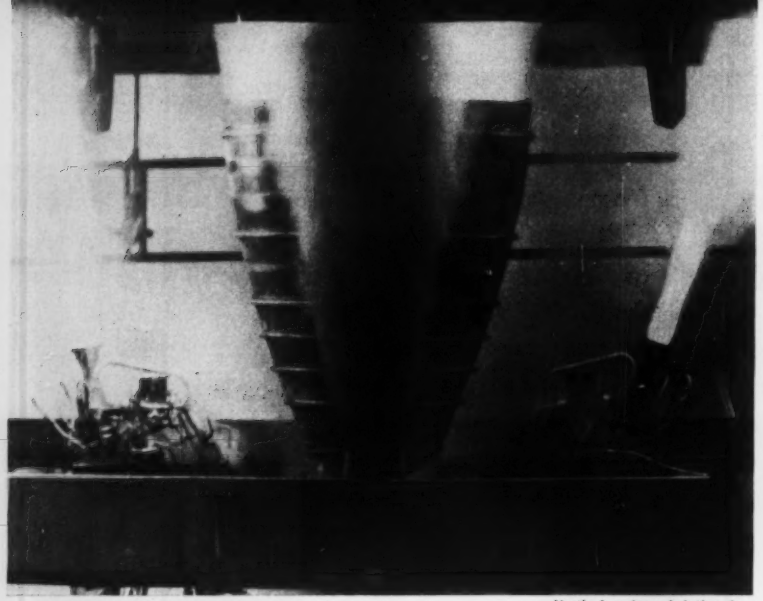
The trend for 1959 will be to larger units, automated systems, and custom designed installations which will have tank capacities ranging up to hundreds of gallons.

Narda has just completed the first of several large pushbutton controlled units ordered by the Air Force for high speed, ultrasonic vapor degreasing of aircraft engine oil filters. The units can also be used for cleaning pistons, spark plugs, valves, bearings, and other hydraulic parts. It is expected that similar units will be installed at many aviation facilities.

Seattle Studies Monorail

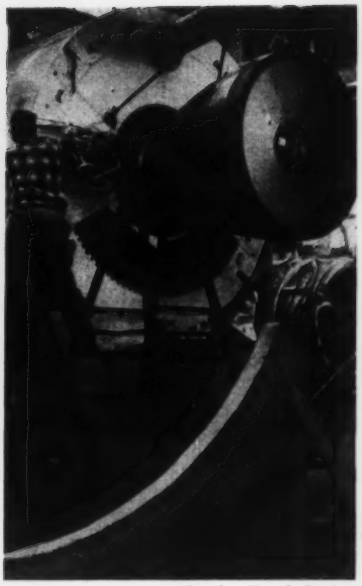
A futuristic monorail train is being studied by the Seattle Transit System. Designed by Lockheed Aircraft Corp. for use during Seattle's proposed Century 21 Exposition in 1961, the four-car train would speed 96 passengers between Seattle's business-hotel district and the exposition grounds (over a mile) in 93 seconds.

The cars, shaped like an inverted U, fit around a beam about 20 ft above street level. Power units in the center of the cars drive the vehicles on a standard rail mounted on the track beam. The track beams are supported by T-shaped structures. Each arm of the T holds one track (inbound and outbound). At terminals, the track would descend to ground level.



North American Aviation Inc.

THOR, liquid fueled powerplant provides thrust for 1500 mile, single stage flight. Twin verniers supply additional thrust plus directional control



Douglas Aircraft Co. Inc.

ASSEMBLY WORKER adjusts twin vernier during powerplant installation

Thor Readied in 2½ Years

Weapons system engineering and skipping prototype stage reduced Thor's development and production time by about one-third of the amount normally programmed

FROM the drawing board to tactical deployment in 30 months—that is the story of the Thor, the Air Force's intermediate range ballistic missile.

Even better, the Thor was designed, developed, and delivered for test firing in the record time of nine and one-half months after contracts were signed. The first Thor and its ground support equipment were being set up in the United Kingdom about two and one half years after the weapon system concept was conceived.

If systems engineering had been applied to autos, all auxiliary facilities (roads, gas stations, part distributors, and warehouse stores) would have been ready when the first horseless carriage was perfected.

• **How It Works**—The airframe for the Thor is a product of Douglas Aircraft Co. Inc., which also assembles and tests the vehicle. The liquid fueled rocket engine, which develops 150,000 lb of thrust, is supplied by Rocketdyne Div., North American Aviation Inc. AC Spark Plug Div., General Motors Corp., provides the inertial guidance system. General Electric Co.'s Missile & Space Vehicle Dept. is responsible for the nose cone. Systems engineering and technical direction for the program are the responsibilities of Space Technology Laboratories Inc. The Thor program is directed by the Air Research & Development Command's Ballistic Missile Division.

• **Really Moves**—The Thor attains a speed of about 10,000 miles per hour and can carry a nuclear warhead. America's first IRBMs to be deployed overseas were flown to England from Santa Monica, Calif., by C-124s. Operational sites in the UK are under construction.

Douglas Aircraft Co. Inc.

MISSILES REST in assembly cradles as they near completion

Thors have been used as single stage rockets, as boosters during tests of nose cone re-entry, and as prime boosters in space probes.

Refinement of the Thor as an operational weapon and space probe booster is continuing with tests at Cape Canaveral, Vandenberg AFB, Sacramento, and Edwards Rocket Base.

Steelmaking Stars In Rise of South

THE SOUTH'S phenomenal industrial and economic growth has been paced by its steelmaking industry, says Arthur V. Wiebel, president of United States Steel Corp.'s Tennessee Coal & Iron Div., Fairfield, Ala.

"In 1948, the annual steel ingot capacity of southern producers was a little less than 4.5 million net tons; today, it stands at over 8 million tons—an increase of close to 90 per cent in a ten year period," points out Mr. Wiebel.

During the period, the U. S. Steel division boosted its capacity from 2.85 million tons to about 4 million tons.

• **Fabrication Doubles** — The increase in steelmaking capacity, Mr. Wiebel says, "is directly connected with the fact that the number of southern fabricators of metal products has also about doubled, and the dollar value added by manufacture at their plants has more than quadrupled."

Although Alabama has more than half of all southern steelmaking capacity, says Mr. Wiebel, other states are coming up fast. "Texas has more than tripled its capacity since 1948; Georgia and Oklahoma have more than doubled theirs, and Mississippi, which did not make a pound of steel ten years ago, can now produce 45,000 tons annually."

Mr. Wiebel also pictures the South as an expanding market. "In 1947 the South represented about 9 per cent of the nation's steel market, but ten years later it was consuming 12 per cent of the nation's steel."

Trailer Sales To Surge

Renewal of public confidence in business, inventory increases, and expansion of plant capacities point to a sharp upsurge in trailer output for 1959, says Harry Eyler, president, Truck-Trailer Manufacturers Association.

Mr. Eyler says: "Our 1958 sales of approximately 48,000 trucktrailers were below normal expectations. We believe 1959 production should be at least 60,000 trailers."

Shoehorn King Employs 90

YOU MAY NOT consider the shoehorn an engineering challenge, but Harold M. Oshry finds it so.

He has applied his engineering and metallurgical training to help Steel Industries Inc. become the GM of shoehorns in the U. S. The Crawfordsville, Ind., firm (it employs 90) makes 90 per cent of the nation's supply (20 million annually). Vice President Oshry credits engineering and careful cost control for his firm's pre-eminence.

• **Complex**—"In 1956 we decided to add a little more bend in the horn's finger grip, and it cost us $10,000 to retool. Of course, we come out with a new model only every three years or so," he says. "As in making everything, you have to figure cost reduction. We had to redesign our equipment to get more production per hour per unit of labor."

Shoehorns are blanked from a ribbon of cold-rolled strip steel, formed, then burnished.

• **Not Wholly Utilitarian**—When a shoehorn is stamped with a shoe brandname at one end and with the name of a shoe dealer down the shank, it is a potent advertising tool. The man horning into his shoes is always reminded of where he bought them and who made them.

Steel Industries services 300 accounts with chain stores, manufacturers, and distributors. It estimates that its horns go into more than 80,000 shoe stores.

• **Makes Other Products** — Shoehorns account for only 10 per cent of the output of Steel Industries. Its remaining capacity is devoted to the manufacture of components for metal brooms, extrusion parts for other industries, and transistor bases.

But, says Vice President Oshry: "It's nice to be tops in something, and we're the biggest thing in shoehorns."

Predicts Record Building

Construction equipment manufacturers and distributors can expect business in 1959 above the average of the last few years, predicts H. D. Anderson, president of the Associated Equipment Distributors.

Mr. Anderson, president of Rish Equipment Co., Bluefield, W. Va., bases his opinion on a predicted general upswing in construction.

"According to best estimates, contracts to be awarded in 1959, both commercial and private, should exceed those of 1958 and in all probability will be the highest number ever awarded," he says. For most distributors, 1958 was a "disappointing" year.

But, Mr. Anderson warns, the industry's potential gains hinge on better management practices. Distributors will have to analyze their business costs, trim nonessential expenses, and look for more economical ways to do each job. This, he adds, includes turning down unprofitable business. Mr. Anderson spoke before the annual meeting of the Associated Equipment Distributors in Chicago.

When you shop for incentive plans . . . . . .

1. Seek advice from a professional consultant.
2. See that the plan fits your needs.
3. Look for a plan that's easy to understand.
4. Be prepared for increased administrative salaries.

And, if you install a plan . . .

1. Anticipate union antagonism.
2. You'll have to adopt uniform labor relation policies.
3. Make certain that standards are rigidly maintained.
4. Ride herd on the plan so it won't run away.

Incentives: Challenge to Managers

YOU can cut unit costs and spur output with incentive programs for hourly workers if you are willing to pay the price.

The potential and the price are indicated in a survey of 29 industries (11 in metalworking): Most firms can expect an average increase in productivity of more than 50 per cent, a decrease in unit costs of about 25 per cent, and higher wage payments on the order of 20 per cent in the first year of a professionally engineered program.

Source: A survey by John D. Dale, president, George Elliott Co. Inc., a New York management consulting firm (see Page 53).

• **Dangers**—Despite the potential, an incentive system does not carry a guarantee of success. One plant manager puts it this way: "The first year with incentives is great; productivity leaps, but five years later we're battling a Frankenstein."

What causes an incentive system to go sour? Here are a few of the pitfalls: Loose standards, improper work measurement, worker innovations which inch up production, insufficient maintenance, union opposition, and complicated formulas.

Though the potential gains are large, the problems of cost, administration, and negotiation can outweigh the benefits of an incentive system. That's the experience of Eaton Mfg. Co., Cleveland, a company that has traveled the full route with incentives. "At the end of World War II, the incentive pay rates got out of control at one of our foundries," relates Paul Minsel, vice president in charge of industrial relations. A consulting industrial engineer found that productivity was 30 per cent low and rates 60 cents an hour high for the industry and local community. The disparity had been fed by loose standards. Eaton still operates the foundry but only because the incentive system was dumped in favor of day rates.

Witness the situation of a small steel company in Pittsburgh which made mistakes in setting standards. The company finds that it can alter rates and standards only when a major technological change varies output. The real hook is in the earnings clause: It says that workers will get the average of their earnings for the preceding three months as a new minimum rate.

• **More Rate Trouble**—Hubbard C. Capes, legal counsel for Associated

Industries Benefit from Wage Incentives

	No. of Cases	% Increase in Productivity*	% Decrease in Unit Costs*	% Increase in Employee Earnings*
Meters, Measuring Instruments	9	81.22	33.44	29.00
Metal Rolling & Extruding	6	74.00	39.00	25.67
Fabricated Metal Products	46	74.00	29.43	27.48
Electrical Mechanisms	19	71.63	31.11	25.84
Primary Metal Products (Foundries)	20	71.00	33.00	29.50
Miscellaneous Small Items (Stampings)	22	70.82	35.36	26.27
Transport Equipment (except Autos)	7	70.43	31.86	31.71
Machinery Mfg. (except Electrical)	18	69.56	29.56	28.44
Rubber Products	4	64.00	31.50	26.50
Railroads	1	49.00	59.00	39.00
Automobiles & Auto Equipment	4	39.00	19.00	19.00

*Weighted average percentages.
Source: John D. Dale survey, November, 1958.
Survey covers 305 installations by 17 professional consulting firms.

Industries of Cleveland, cites another case in which a small stamping company had problems with incentives. Historically, the company had paid material handlers a manhour base per ton. After years of using manual labor to move sheet steel, the company installed an overhead crane and retained the same work group at the usual base rate. Management placed the job on group incentives without going into job evaluations or standards studies. In one month, the workers received a bonus of more than 51 per cent.

• **Evolution**—During the last decade, emphasis has shifted from piecework to standard hour systems. H. D. Crumbaker, secretary-manager, Cleveland Branch, National Metal Trades Association, surveyed 71 metalworking companies and plants in northeast Ohio last summer. He reports that 30 per cent of the companies have incentive or measured daywork plans, with the preponderance using standard hour programs for direct labor on an individual basis.

Other trends stem from management efforts to avoid administrative headaches. The director of industrial relations for a large storage battery company says that in the last two years his company switched from a split payment to a standard hour plan. He comments that the employees understand the new system, and it is easier to administer. He also discloses that some intermediate sized battery companies are looking at the monthly bonus plans which are based on over-all productivity in a plant.

• **IAM Decries Incentives**—Group or plant-wide plans may tend to quiet union objections to incentives because they usually want across-the-board incentives so all members benefit. E. R. White, general vice president, International Association of Machinists, has this to say: "Incentives are simply a carrots-dangled-in-front-of-the-donkey attempt by management to substitute a pay plan for effective supervision. Our union doesn't believe in incentives and resists them whenever possible. If they must be used, make them fair and honest."

The share of production value plan of Allen W. Rucker is being used by many companies. Results with the team performance concept include: Higher output per manhour, savings in raw material, reduction in rejects and do-overs, improvements in product quality, plus widespread worker participation in cost cutting programs. Mr. Rucker is president, Eddy-Rucker-Nickels Co., management consultant, Cambridge, Mass.

While not a panacea, the Scanlon plan is helping some companies resolve production problems. The plan, developed by the late Joseph N. Scanlon at Massachusetts Institute of Technology, has proved worthwhile for a steel fabricating company in upstate New York. This company's experience was reported in the National Industrial Conference Board's *Management Record*, October, 1957. Since installation of the plan, labor is sharing in relation to output on a monthly basis; morale is higher; there is co-operation among company managers and leaders in the steelworkers' union; more cost cutting ideas are being submitted; foremen are better leaders; and all employees realize the "customer is the boss."

• **Counterviews**—Some wage administrators say that group bonuses, company-wide plans, or annual improvement factors are too far removed from the individual worker's contribution to provide suitable challenges, or even be called true incentives.

Marshall Dyer, assistant to the president, Trundle Consultants Inc., Cleveland, a proponent of individual measurement, offers this advice:

"Maintain your plan by having tight management through competent industrial engineering . . . provide depth in the department so promotions won't destroy the effectiveness of control . . . use standards that detail individual tasks in terms of time—then follow through with production planning, methodizing, and controls . . . and, above all, be sure the plan fits your needs."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Metalworking's '58 Profits Didn't Match '57's

(Net profit)

SELECTED MANUFACTURERS	1958	1957
Air Reduction Co. Inc.	$13,349,885	$16,476,180
Aluminum Co. of America	42,885,230	75,568,461
American Brake Shoe Co.	4,777,738	9,124,438
American Can Co.	46,432,856	42,169,139
American Meter Co. Inc.	2,144,000	2,266,000
Avco Mfg. Co.	11,597,000	12,833,000
Bendix Aviation Corp.	21,171,902	27,499,034
Blaw-Knox Co.	6,860,000	7,007,000
Bliss & Laughlin Inc.	1,476,164	2,445,773
Budd Co.	1,919,000	8,865,807
Case (J. I.) Co.	4,313,780	1,303,628
Caterpillar Tractor Co.	32,239,831	40,012,023
Chain Belt Co.	3,879,000	4,585,000
Cleveland-Cliffs Iron Co.	8,997,000	13,015,000
Continental Industries Inc.	1,008,548	526,124
Continental Motors Corp.	3,536,528	3,583,301
Cooper-Bessemer Corp.	3,308,892	5,338,832
Copeland Refrigeration Corp.	795,570	1,065,866
Copper Range Co.	2,588,000	2,164,979
Diamond Alkali Co.	6,475,000	7,035,166
Deere & Co.	42,067,809	28,681,610
Douglas Aircraft Co.	16,847,000	30,665,252
Dresser Industries Inc.	9,882,233	20,620,453
Eagle-Picher Co.	2,090,094	4,266,706
Emerson Radio & Phonograph Corp.	1,410,009	138,431
Ferro Corp.	1,988,000	1,682,677
Foote Bros. Gear & Machine Corp.	294,566	1,083,440
Ford Motor Co.	95,700,000	282,754,541
Freeport Sulphur Co.	13,084,067	12,973,328
Gar Wood Industries Inc.	503,303	513,623
IBM Corp.	126,191,858	89,291,589
International Harvester Co.	42,987,435	45,620,283
Johns-Manville Corp.	21,942,000	17,781,885
Kaiser Aluminum & Chemical Corp.	25,232,000	26,829,237
Kennecott Copper Corp.	59,385,991	79,251,667
Koppers Co.	6,609,257	9,448,842
Magma Copper Co.	694,474	(a)2,340,548
Maryland Shipbuilding & Drydock Co.	2,125,885	1,935,843
Miehle-Goss-Dexter Inc.	2,861,878	4,247,869
Minneapolis-Honeywell Regulator Co.	22,560,459	21,367,135
Monsanto Chemical Co.	34,550,000	37,416,000
Mueller Brass Co.	1,501,290	1,267,000
Oliver Corp.	2,594,381	608,454
Philco Corp.	2,866,000	4,081,000
Raytheon Mfg. Co.	9,403,000	4,828,000
Reliance Electric & Engineering Co.	3,773,000	6,096,000
Rockwell Mfg. Co.	7,417,000	9,648,000
South Bend Lathe Works	505,390	972,440
Standard Forgings Corp.	184,317	965,928
Studebaker-Packard Corp.	(a)13,850,000	(a)11,135,000
Union Carbide Corp.	124,936,845	133,740,818
United Engineering & Foundry Co.	6,909,111	5,069,960
Westinghouse Electric Corp.	74,772,000	72,652,000
Woodward Iron Co.	3,633,000	3,385,334

(a) Net loss.

Steelmakers Slipped, Too

SELECTED COMPANIES	1958	1957
Acme Steel Co.	$5,270,000	$6,016,524
Alan Wood Steel Co.	2,109,000	2,054,000
Allegheny Ludlum Steel Corp.	5,844,803	11,651,851
Armco Steel Corp.	57,233,314	68,297,928
Barium Steel Corp.	(a)1,895,000	(b)
Bethlehem Steel Corp.	137,741,946	191,025,933
Colorado Fuel & Iron Corp.	2,147,223	14,236,851
Copperweld Steel Co.	2,081,114	2,769,855
Granite City Steel Co.	9,374,000	9,984,451
Inland Steel Co.	47,869,042	58,876,875
Jones & Laughlin Steel Corp.	23,198,000	45,452,000
Kaiser Steel Corp.	5,422,271	21,438,507
McLouth Steel Corp.	9,998,000	9,410,000
National Steel Corp.	35,827,414	45,518,884
Pittsburgh Steel Co.	(a)866,000	4,155,000
Republic Steel Corp.	61,921,680	85,014,422
U. S. Steel Corp.	301,302,643	419,406,956
Wheeling Steel Corp.	8,899,000	12,078,000
Youngstown Sheet & Tube Co.	21,501,320	42,508,579

(a) Net loss.
(b) Comparison not realistic due to "spin-off" of subsidiaries.

Near-Record Profits on the Way

EXPECT most metalworkers to have record or near-record earnings this half. In 1958's last quarter, profits surged upward—pushing to new highs in scattered cases and offsetting the losses of previous months in others.

• **Who'll Gain Most** — Based on trends and the predictions of industry leaders, here's what to expect in 1959's first half:

1. Record earnings for aluminum producers and makers of cans, farm equipment, office equipment, electrical equipment, and some fabricated metal products.

2. Near-record profits for steelmakers, most instrument people, some component makers, and some producers of consumer durable goods—especially those closely tied to the trend in new home construction.

3. Notable absentee: Capital goods industries. Their earnings are inching upward too slowly to hit the 1957 level by the end of this year.

4. Some aircraft and automotive firms will chalk up record or near-

record profits; others will settle for a "good" year.

• **Here's Why**—Profit per sales dollar is rising for many industries. That's because volume is climbing faster than costs. Component prices are lagging (Page 45) and firms will benefit from recession-induced cost trimming and use of more efficient facilities. Some cost-saving equipment purchased during the capital spending boom two years ago hasn't been worked at full capacity until now.

An opposite situation is noticeable around some steel plants. Marginal facilities are being called into service as steelmakers scurry to fill a deluge of orders. The industry's first half operating rate could exceed 80 per cent. So the volume will more than offset the higher production costs of inefficient facilities, signaling the best profit period in two years or more.

• **What Steelmakers Say** — Steel company officials unanimously predict improved earnings during '59's first half. Example: Wheeling Steel Corp.'s president, W. A. Steele, says prospects for "early 1959" are "most encouraging." But steel brass aren't saying much about third quarter prospects. Asserts J. L. Mauthe, chairman, Youngstown Sheet & Tube Co.: The first half "is as far in the future as it seems sound to attempt a prediction."

A third quarter dip is almost certain, because of a lengthy strike or the liquidation of inventories being built in anticipation of a stoppage. E. J. Hanley, president, Allegheny Ludlum Steel Corp., sums it up this way: There'll be a strong second quarter, a setback in the third, and a pickup in the fourth.

Last year, steel companies proved that, after substantial fat trimming, they could make a profit operating at about 61 per cent of capacity. Continued benefits from the expense paring programs, coupled with operating rates of 85 per cent, could bring record profits to some firms in the second quarter.

• **In Metalworking**—This may be the year we discover how high the economy can go without good support from the capital goods industries. Machine tool builders, for example, say it will take them two years (till late 1960) to climb back to the 1957 level (see STEEL, Dec. 29, 1958, p. 27). That means a profit upswing will have to find its impetus elsewhere.

• **Electrical Equipment**—Much of the stimulus will come from this fast growing group. Many electrical equipment makers expect record profits this half. Example: Raytheon Mfg. Co., Waltham, Mass., doubled its income from '57 to '58 and looks for "continued improvement this year." Charles F. Adams, president, asserts: "Industrial electronics is unquestionably the next major growth area."

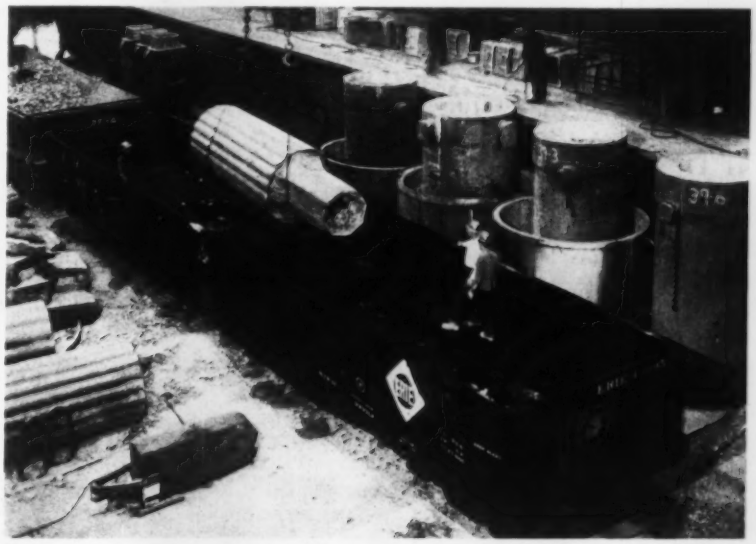
Another indicator: Westinghouse Electric Corp.'s '58 earnings topped '57's by 2.9 per cent.

• **Farm Equipment**—Farm suppliers had a bumper year in 1958. While farm income may drop a little this year, many suppliers expect farmers to invest their '58 profits in '59-model equipment. Oliver Corp. expects to earn more money this year than last. J. I. Case Co.'s 1958 net income more than trebled that of 1957 while sales rose 43 per cent to a record. Exports are the soft spot in the outlook.

• **Automotive**—With prospects for 5.5 million to 5.8 million domestic car sales this year, the automotive industry will show substantial profit gains compared with 1958—when keeping red ink off the books was a major task. But the fourth quarter (1958) reversal, when even Studebaker-Packard Corp. showed a profit ($8.7 million), signals a near-record half for the industry. F. S. Cornell, executive vice president, A. O. Smith Corp., sums up the auto picture this way: "Every day it looks more bullish than the day before."

• **Nonferrous**—Aluminum producers, riding on brisk sales promotion and expanding uses, expect record earnings. Copper producers will have a good half if the price doesn't drop. Titanium sales are staging a comeback; Mallory-Sharon Metals Corp. is figuring 1959 sales at $18 million, vs. $13 million last year.

• **Office Equipment** — Accustomed to setting records, the office equipment people expect to continue the practice. But their growth rate is slowing. International Business Machines Corp., for example, is eating heavily into its backlog.



THIS SPECIAL GONDOLA CAR constructed in the Erie Railroad's Erie, Pa., shops takes on a 44-ton passenger at the electric furnace melt shop of Sharon Steel Corp., Sharon, Pa. The alloy steel ingot, 17 ft long and 54 in. in diameter, was centered on movable struts. Another such car is in service at Sharon; the Erie is building two more. Built to accommodate two smaller ingots, the cars are 52 ft 6 in. long, 9 ft 8 in. wide, can handle up to 140,000 lb. They are easier to load and safer on the road since the ingots cannot shift or slide from their cradles

New Committee Line-Up Signals Trends

REMEMBER FDR's famous maneuver of the thirties —"packing" the Supreme Court in his favor? Every other year on Capitol Hill the same sort of byplay goes on with committee assignments. This year the practice is significant because of the lopsided Democratic majority. Committee assignments tend to indicate what sort of legislation the Democratic Congress aims to push hardest.

Last week's quick work on the housing and airport bills shows you how a well organized committee (from Senate Leader Lyndon Johnson's point of view) can work. Hearings were rushed on Sen. John Sparkman's (D., Ala.) omnibus housing bill, which could cost almost $3 billion, and Sen. Mike Monroney's (D., Okla.) $575 million airport construction bill. Both bills went to the floor for full debate in record time for this early in the session.

The only Senate group with much of a conservative point of view is Sen. Harry Byrd's (D., Va.) Finance Committee. Even there, you can see the trend to more liberalness in the appointments of freshmen Democrats Eugene McCarthy (Minn.) and R. Vance Hartke (Ind.). Significantly, none of three new Republicans appointed to the committee were of the liberal variety.

Two Committees Will Spend More

Senator Johnson's investigations of our missile and space programs indicate that the Democrats will try to spend more than President Eisenhower requested for fiscal 1960. Most observers agree that the makeup of both the Aeronautical & Space Sciences and Appropriations Committees practically guarantees a rubber stamp for whatever Senator Johnson asks.

To the House Appropriations Committee come seven new Republicans (including one freshman) and one new Democrat. Among the Republican appointees, the conservatives dominate. Looking at the record, only Rep. John Pillion (N. Y.) has indicated much support for the Eisenhower wing of the party on important votes. Leading Republican supporters of the President tended to get committee assignments of less importance.

Ways & Means Is Little Changed

While the tax writing House Ways & Means Committee has seven new members, there appears to be no change in its character from last session. Industrial states keep about the same representation they had, with a slight shift from the East to the West. Chairman Wilbur Mills (D., Ark.) will have this group well in hand, most observers say. The three new Democrats voted for passage of the Reciprocal Trade Act last session, while only one of the four new Republicans were in the Eisenhower camp.

There is some feeling the conservative element of the House Rules Committee was strengthened by the appointment of two Republicans. Rep. Howard Smith (D., Va.), its chairman, has the power to hold up legislation because his committee must vote bills out to the floor of the House after they have been cleared by their originating committees. Conservative Republicans often team with Representative Smith to avoid votes on liberal legislation as long as possible.

Gore Leaves Road Committee

One of the most important pieces of legislation for metalworking will be the move to kill the Byrd pay-as-you-go amendment to the Federal Highway Act. (If the Byrd amendment stands, the program is in danger of a drastic slowdown because the highway trust fund is running in the red.) On the Senate side, only two old members of the Roads Subcommittee remain: Pat McNamara (D., Mich.) and Richard Neuberger (D., Oreg.). Biggest change: Road enthusiast Albert Gore (D., Tenn.), former chairman, left the committee to take an assignment on foreign relations.

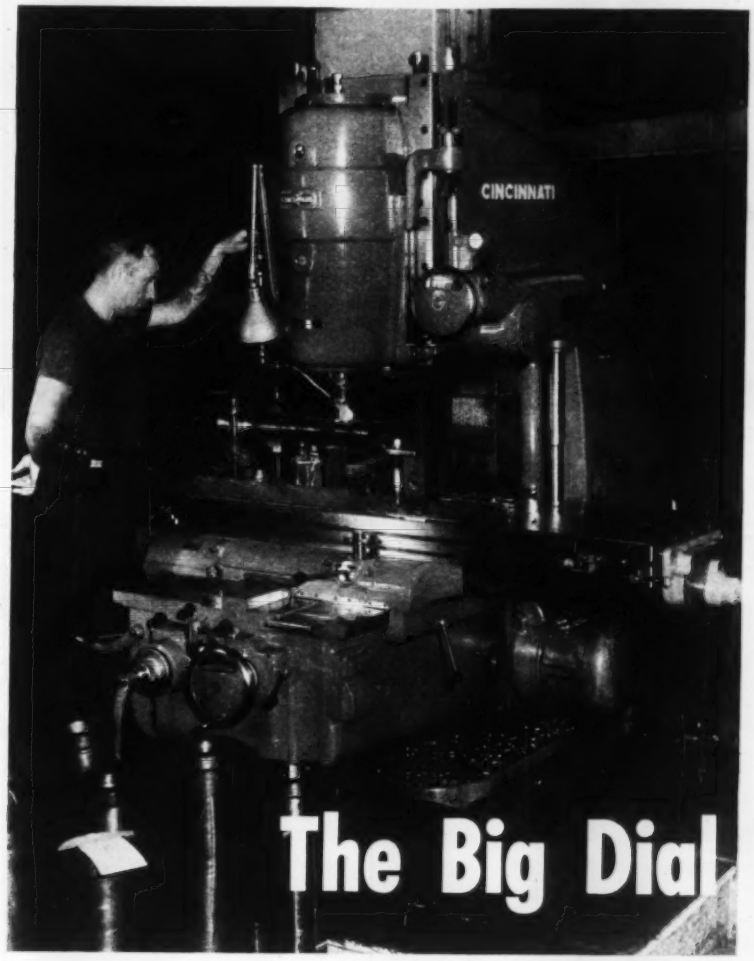
Rep. George Fallon (D., Md.) keeps his chairmanship of the House Roads subcommittee and gets three more Democrats to work with. Republicans lose one.

Fulbright Heads Foreign Relations

With the resignation of Sen. Theodore Green (D., R. I.) as chairman of the Foreign Relations Committee, dynamic and internationalist minded Sen. J. W. Fulbright (D., Ark.) steps up. Because the committee is packed with many liberals and under new leadership, you can expect it to take a more important position in advising the administration and making its wants known to the State Department. The meeting of Secretary John Foster Dulles with Senator Fulbright before his trip to Europe last week indicates that.

The addition of Democrats Albert Gore (Tenn.), Frank Lausche (Ohio), and young Frank Church (Idaho) to the committee, along with Frank Carlson (R., Kans.) promises to back up this new look.

You can also count on this committee to back Senator Johnson's demands for more spending on our missile and space programs.



CINCINNATI

Cutting deeply through metal and costs is easy for the big Dial Types. Amount of metal removed during the milling operation (oil well equipment parts) is indicated in the drawing. Machine: No. 5 Vertical Dual Power Dial Type, 50 hp drive.

Sizes Available

High Power Dial Type	
Nos. 215-16, 315-16, p., u., v.	15
Nos. 320-18, 420-18, p., u., v.	20
Nos. 425-20, 525-20, p., u., v.	25
No. 625-20, pl. and vert.	25
Dual Power Dial Type	
Nos. 220-16, 320-16, p., u., v.	20
Nos. 330-18, 430-18, p., u., v.	30
Nos. 450-20, 550-20, p., u., v.	50
No. 650-20, pl. and vert.	50

Note: p. u. v. = plain, universal, vertical

The Big Dial Types

are Tops in MILLING Large Parts . . . and taking DEEP CUTS in Metal and Costs

Working range and cutting capacity are on a big scale in the big CINCINNATI High Power and Dual Power Dial Type Milling Machines. And cost performance is on a big scale, too; production costs are much lower than obtainable with older shop equipment. The brief statistics listed below tell why:

Extra large working surface and range—50" and 60" table traverse, respectively, for the Nos. 5 and 6 sizes (three smaller sizes also available).

Powerful drive—50 hp motor for the larger sizes.

One lever, power selection of speeds and feeds.

Dynapoise overarm—smooths out the cutting action (horizontal machines).

Automatic backlash eliminator—automatically engages only while the cutter is removing chips.

These and other advantages give the CINCINNATI High Power and Dual Power line the highest replacement value for old knee type milling machines now inadequate for heavy duty toolroom and production milling. Complete details are contained in catalog No. M-1917-4. Write for a copy or telephone Cincinnati RE 1-2121.

MILLING MACHINE DIVISION
The Cincinnati Milling Machine Co.
Cincinnati 9, Ohio

CINCINNATI® **KNEE TYPE MILLING MACHINES • BED TYPE MILLING MACHINES**
DIE SINKING MACHINES • CUTTER AND TOOL GRINDERS

in IR heavy-duty compressors

FULL-FLOATING ALUMINUM BEARINGS
Roll with the punch of each stroke to distribute load

SEALED FRAME
Keeps dirt out • Keeps oil in
Keeps wear down

AIR-CUSHIONED CHANNEL VALVES
Highest efficiency • Exceptional durability • Quiet operation

FULL FORCE-FEED LUBRICATION
Filtered oil under pressure to all bearing surfaces

these EXTRA-VALUE FEATURES mean top performance and economy

take CHANNEL VALVES for example...

exclusive air-cushioned action means long life, high efficiency and quiet operation

The air-cushioned I-R Channel Valve is the greatest advance ever made in compressor valving, and is entirely different in principle and design. No other valve can approach its efficiency, quietness and almost unbelievable durability. The Channel Valve has eliminated the major problem of impact, without using heavy parts which kill efficiency or frail elements which soon break or wear out.

The Channel Valve is actually a combination of several small valves — each channel with its bowed leaf spring operates individually over a corresponding slot-shaped port. The channel lifts straight up in the guides without flexing; opening is uniform over the full length of the port, giving uniform air velocity without turbulence. The cushioning takes effect when a small volume of air is trapped between the channel and its leaf, causing the channel to float silently to a stop.

Channel Valves are a product of Ingersoll-Rand's own valve research and manufacturing departments, and constitute only one of the quality features which have given the I-R compressor line its reputation for excellence. For more information about compressors for any service, from ½ to 7500 hp, call your I-R representative.

ESH
20 to 150 hp.

PHE
75 and 100 hp.

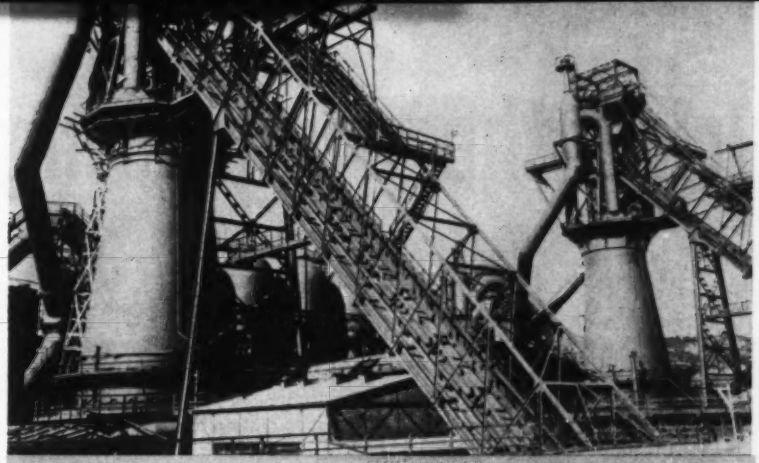
XLE
125 to 350 hp.

PRE
400 to 2000 hp.

XPV
200 to 1500 hp.

IR **Ingersoll-Rand**

1-886 11 Broadway, New York 4, N. Y.



Finsider's Growth Rapid

(Production in net tons)

Year	Pig Iron	Crude Steel	Hot-Rolled Products	Iron Ore
1957	1,869,234	3,819,964	3,044,125	1,320,748
1956	1,654,594	3,227,594	2,614,561	1,295,945
1950	303,393	1,029,767	864,036	292,305

Source: Finsider.

Italian Steel Firm Zeros in On World Markets

ITALY'S LARGEST iron and steel producer, the Finsider Group, is on the threshold of direct competition with other world steel organizations. The recent creation of the European Common Market, eliminating protective tariffs, fits into Finsider plans for capturing markets as it develops a steel industry unsheltered by the government.

Finsider rose from the rubble of World War II to score gross sales of $600 million in 1957.

Presently, it produces over 80 per cent of Italy's pig iron and more than half of the country's crude steel and hot rolled products (see table).

• **What Is Finsider?**—It is a group of 15 companies, co-ordinated through the parent Societa Finanziaria Siderurgica, operating in a variety of industries: Steel, electrical, electrochemical, refractories, mining, cement, shipping, engineering, research, and educational organizations. The group is 54.43 per cent privately owned; the rest is indirectly held by the government.

• **How Did It Grow?**—Finsider's rapid rise was accomplished through a five-point program:

1. Installation of modern equipment.

2. Concentration of pig iron, steel, and hot rolled products in a limited number of efficient, specialized plants on the seacoast, providing easy access to incoming raw materials.

3. Arranging furnaces to use either ore or scrap and integrating the largest plants so they will be less dependent on scrap.

4. Installation of continuous or semicontinuous rolling mills, lowering production costs.

5. Stabilizing raw material sources in limited areas and controlling their transportation to keep costs low and independent from fluctuations of free market chartering (vital since Italy has little iron and scrap and no coking coal).

Much short term financing has been done through Italian commercial banks. U. S. commercial banks have also participated directly and indirectly. Loans from the Export-Import Bank and Marshall Plan aid have played an important role, too. Companies in the group are managed by boards of directors, elected by the stockholders.

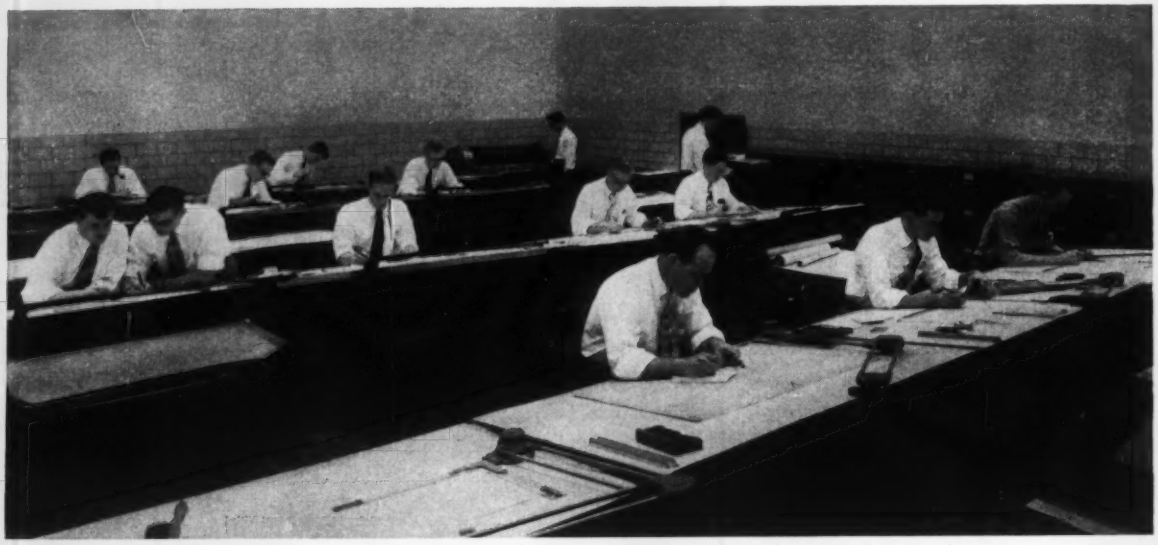
• **Now Steel Exporter**—Italy became an exporter of steel products for the first time in 1956, largely through Finsider's progress. By 1957, the nation exported 1,115,400 net tons of steel products, 84,700 more than it imported. That was an important milestone in the country's economy, for the exports help to pay for needed imports of raw materials. Italy ranks third largest among iron and steel producers in the European Coal & Steel Community.

• **Close U. S. Ties**—Finsider buys 85 per cent of its coking coal from the U. S., which is also the main source of scrap. Finsider has manager training programs with U. S. corporations and signed Armco International Corp. to a long term consulting agreement. It also contracted with U. S. Steel Corp. for a large yearly tonnage of Venezuelan ore.

• **The Future** — Finsider's future looks good. Next year, it plans to produce 5 million tons of crude steel. Exploitation of foreign ore deposits is in progress to supply increased demands.

Although the Italian economy suffered from the recession last year, the dip was not as severe as this country's. Industrial output for the first seven months was up 1.3 per cent over the corresponding 1957 period.

. . . how four of the engineering help you . . . the



1 The advanced product and process engineers at each of our plants are available to assist you with the casting design considerations. It is Central Foundry's practice to suggest design changes that ordinarily do not affect the part functionally, but often reduce casting weight, thus reducing casting costs. Your blueprints are returned to you with parting line, coring and gate locations as well as suggested changes in casting design clearly marked.

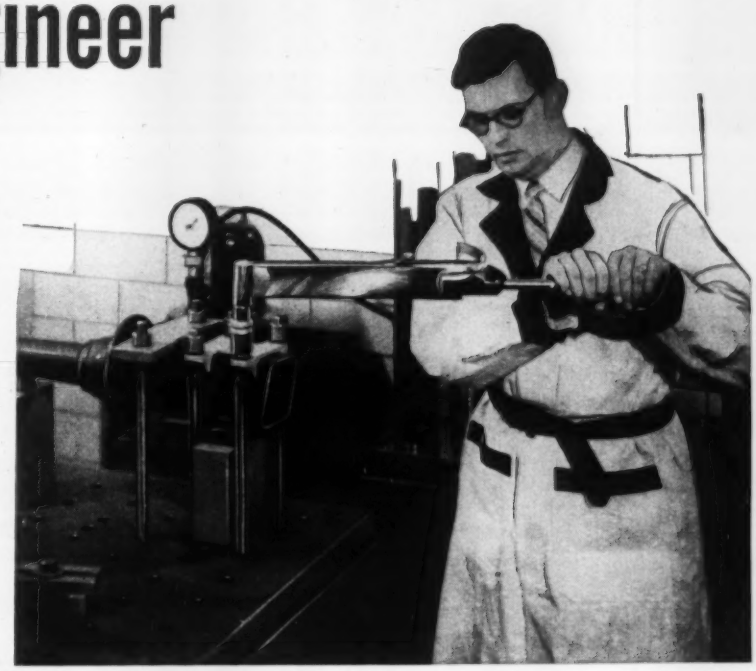
Our engineering staff is specialized to give you expert assistance in each of the metals Central Foundry produces. When you are considering castings of ArmaSteel, malleable iron or grey iron to be cast in either green sand molds or by the more exacting shell mold process, contact the sales department of Central Foundry Division.

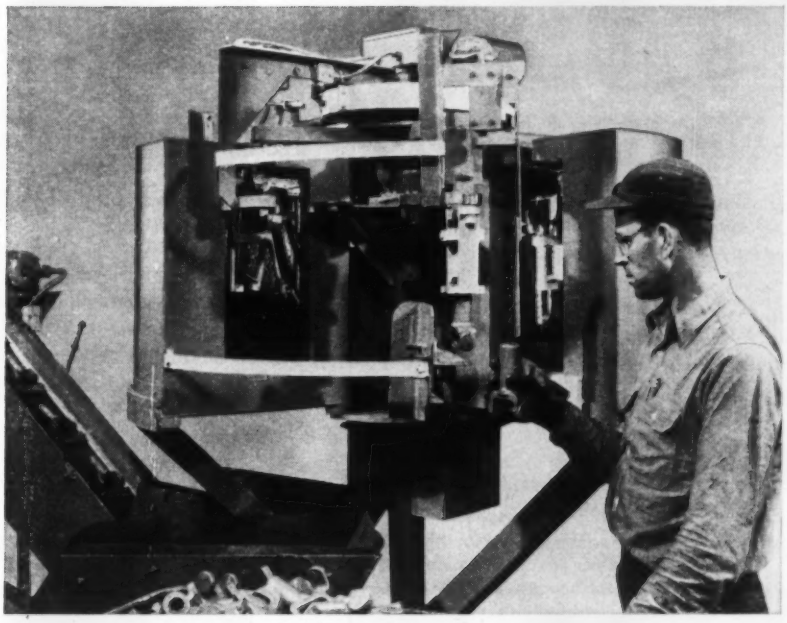
2 Cobalt 60 radiography, a fast, positive method of detecting sub-surface defects, has replaced time consuming breaking, cutting and etching of castings, formerly used by the foundry industry to check new parts for soundness. This technique does not demand destruction of the part and gives positive location of any defects. With radiographs as a guide, our engineers can make necessary changes in gating, feeding and general design that assure quality castings at reduced cost, and do it in hours compared to days required for breaking or cutting.

CENTRAL FOUNDRY DIVISION

services at Central Foundry design engineer

3 Stress Analysis is also used at Central Foundry in the design or redesign of castings to reduce weight and improve mechanical strength. By an accurate study of stress, both statically and dynamically, Central Foundry engineers are able to suggest design changes, to put metal where it is needed, remove excess material, to recommend the best material for your part and thus assure the highest quality castings at the lowest possible cost.





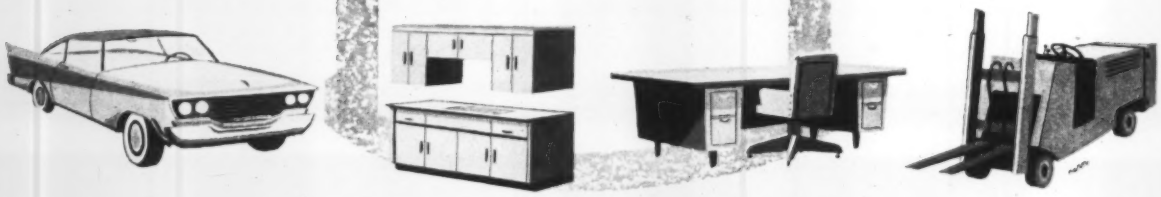
4 Sonic testing is an electronic listening device developed by Central Foundry that automatically distinguishes between the vibrations of good and faulty castings and sorts them accordingly. The sonic testing machine, much faster and more accurate than visual inspection, eliminates human error and is ideally suited to high production of castings designed for critical applications.

Central Foundry, with plants in Saginaw, Michigan, Defiance, Ohio, and Danville, Illinois, has the vast facilities and engineering services necessary to deliver, on schedule, quality castings in production quantities. Our sales engineers, product development engineers, foundry engineers and modern engineering services are all available to help you get quality castings . . . at low cost . . . in less time.

MEMBER MALLEABLE CASTINGS COUNCIL

GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 20

PRODUCT PROTECTION BY THE GALLON

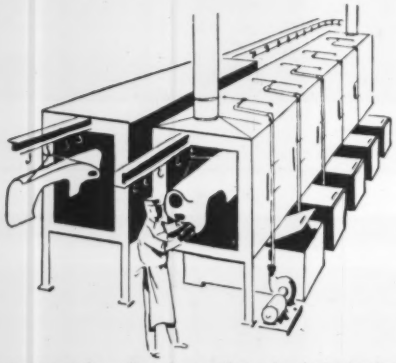


WITH AMCHEM GRANODINE!

One of the most widely used metal finishing chemicals, Amchem Granodine is the most effective pre-paint treatment yet developed for the protection of fabricated steel products.

The non-metallic phosphate coating produced by Amchem Granodine provides an effective base for durable paint finishing and greatly improves the corrosion resistance of the finished product. A variety of Granodizing processes are available for a wide range of finishing operations . . . to assure your products of greater usability through lasting protection.

It may be well worth your while to investigate cost saving, efficient Amchem Granodine—today's most modern metal finishing chemical for steel. Check Amchem where service goes beyond the product with a complete program of technical and engineering assistance!



Granodizing process may be applied by power spray (shown on left), dip system or by hand application.

Write for Bulletin 1380 with Selection Chart to help you choose the Granodine type for your specific needs—and bulletins featuring other Amchem chemicals of vital interest to the fabricator of steel products.

AMCHEM AMCHEM GRANODINE

Amchem Granodine is another chemical development of **Amchem Products, Inc.**, Ambler, Pa. Formerly American Chemical Paint Company, Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont./Amchem and Granodine are registered trademarks of Amchem Products, Inc.

Richard E. Henrich

Chrysler's 1960 Model Countdown

Idea sketches collected	November, 1955
First master timing schedule published	January, 1956
First profile compiled	May, 1956
Styling theme approved, Profile finalized, Master time schedule revised	January, 1957
Clay models approved, Profile approved	May, 1957
Drafting room schedules set	July, 1957
Major die models completed	October, 1958
Tooling finished	May, 1959
Tool tryout	June, 1959
Pilot production starts	September, 1959
1960 models introduced	November, 1959

Product Programming Starts Early

WALK into any automotive tooling shop a few months before model introduction and you're apt to find the boss screaming that the carbuilders are putting him behind the eight ball with last minute engineering changes.

Suppliers find it hard to believe, but such changes are more of a headache to the automakers themselves. Juggling some 25,000 new parts through design, tooling, and into production calls for strict adherence to timing schedules and product designs established at least two years before the car is ready for the market.

At Chrysler Corp., much of the co-ordinating responsibility for defining the car and establishing master timing schedules that all groups and divisions must follow rests on the Product Programming Dept. Richard E. Henrich is assistant chief engineer in charge of this group. He collaborates closely with the corporation's product planning staff to see that target dates for final designs, tooling, and supplies are met and that the new models follow approved design themes.

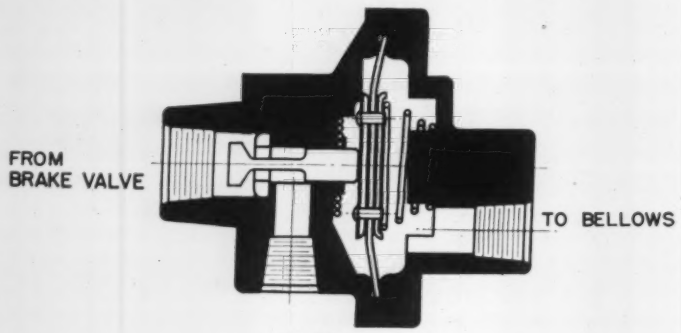
• **Recent Setup** — Chrysler established its present Product Programming Dept. within the Engineering Div. in January, 1956. By co-ordinating these activities through a central group, the company can take better advantage of part interchangeability and avoid duplication of effort on the part of each division and various manufacturing facilities. It's an engineering function because Chrysler believes much of a car's success in the market place rests on how well it's engineered.

• **Profile**—Mr. Henrich's job consists of profiling and scheduling. He explains: "Some three to three and a half years before the model is introduced, product programming starts holding meetings with vehicle divisions, marketing, engineering, styling, and manufacturing staffs to determine what each would like in the new model. Those ideas and concepts are sifted through committees for several months until a firm definition (profile) of the car is achieved."

All the material is separated into four basic parts and compiled into an 8 by 11 in. profile book containing perhaps 50 pages. A description of what the car looks like, what kind of engine, transmission, and other components it will have is in the first section. The second contains target costs for each item in

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

New GMC Brake Modulator



Modulated brakes that stop trucks in about the same distance it takes to halt passenger cars have been developed by General Motors Corp.'s GMC Truck & Coach Div., Pontiac, Mich. The device includes a brake regulating valve that automatically adjusts the braking effort at the rear wheels in proportion to the load on the wheels. It uses the air suspension system as a pressure source.

Philip J. Monaghan, GMC's general manager, explains the operation of the brake this way: "On an air suspension tractor, the leveling valves always maintain normal standing height regardless of the load. They do this by increasing the pressure within the bellows as the load increases.

"Since the air pressure within the bellows varies in exact proportion with the load, the brake regulator valve, which limits the air pressure used for braking in proportion to the pressure within the bellows, automatically has the proper maximum brake pressure for the load being carried by the tractor."

the car as well as design cost trend curves. The third breaks the car down by weight, a vital factor in cost and design. Finally, there's a section covering all new specifications. It also contains as much information as can be gathered on competitive makes for the same model year.

• **Gets O.K.** — When the profile book is completed, it's presented to the corporation's administrative committee for approval. Usually, styling and design renderings accompany it. All company models are included. Even before Chrysler's top brass have approved the profile, Mr. Henrich's department and the corporation's product planning staff begin setting up a master timing schedule (MTS) so each division, department, and section will have specific target dates.

• **Sets Dates**—"There are about 90 key dates that groups within the corporation must meet if the car is to get off on time," declares Mr. Henrich. At least 50 of them affect engineering (others are for manufacturing, purchasing, and supplier groups).

After the MTS is established, each of the major target dates is broken down further. For example, the 50 MTS dates that affect engineering are expanded to 120 for different engineering groups. These are broken down into departmental and section schedules.

"Throughout the corporation there may be as many as 20,000 specific dates that must be met. We can't afford a day's delay because missing a target in just one department can throw off the entire schedule," asserts Mr. Henrich.

• **Monitors** — After schedules are set, Mr. Henrich's group, working with corporate product planning, begins monitoring performance to guard against hitches and make sure groups and sections meet deadlines.

As the car moves closer to production, more changes are initiated. The number depends on public reaction to current models, what competition does, and what cost cutting methods or materials may crop up among corporate groups. All changes are recorded in the profile book. "The profile is fluid, but once costs and basic designs are set, it's unlikely any changes will be accepted that will add to the total cost," says Mr. Henrich.

• **On Target**—The last few months are a hectic race as date after date slips by, but finally die tryouts are over, parts banks are ready, and new models are phased in as pilot runs are completed.

By model introduction time, product programming is deeply involved in monitoring performance on next year's models, setting schedules for the year after that and compiling profile books on cars that won't appear on the street for another three years.

U. S. Auto Output

	Passenger Only 1959	1958
January	543,600*	489,357
February		392,112
March		357,049
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,926
Total		4,243,374

Week Ended	1959	1958
Jan. 3	97,664	76,653
Jan. 10	133,362	120,140
Jan. 17	135,953	109,761
Jan. 24	126,843	107,495
Jan. 31	119,753†	104,359
Feb. 7	120,000*	109,028

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

ARISTOLOY

COLD FINISHED BARS

COLD DRAWN BARS
Rounds . . . 1/2" to 3-1/4"
Hexagons . . . 9/16" to 1-11/16"

TURNED BARS
11/16" to 6-1/4" incl.

TURNED AND POLISHED BARS
11/16" to 3-1/2" round

GROUND AND POLISHED BARS
1/2" to 3" rounds

TURNED, GROUND AND POLISHED BARS
11/16" to 4" rounds

BEARING QUALITY • AIRCRAFT • PISTON PIN QUALITY • ELECTRIC FURNACE ALLOY ELECTRIC FURNACE CARBON • ALLOY BASE ALLOY • QUALITY CARBON

LEADED* — Electric Furnace 52100 Electric Furnace Alloy • Electric Furnace Carbon • Alloy Base Alloy • Quality Carbon

STAINLESS—300 Series • 400 Series • 500 Series
*Inland Ledloy License

NEW PRODUCTS & FACILITIES CATALOG

Describes melting, rolling, thermal treating and finishing capacity of Copperweld's Aristoloy Steel Division. Complete product listing for Aristoloy carbon, alloy, stainless, leaded and nitriding steels. Send for your copy today.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

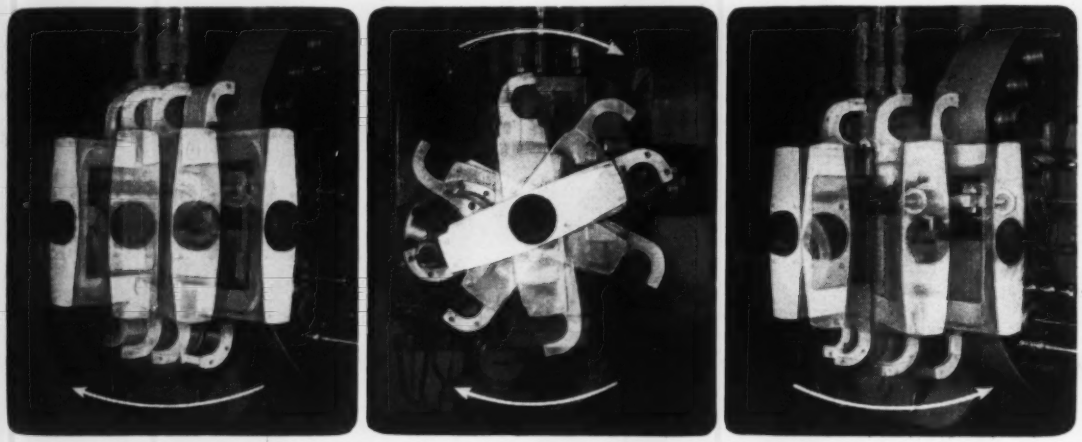
ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

*a machine that harnesses the **full** potential of numerical control:*

KTNC

KEARNEY & TRECKER MILWAUKEE-MATIC

*a flexible, automated machining center—**with automatic tool changer**— that unifies milling, drilling, reaming, tapping and boring operations in a single machine*

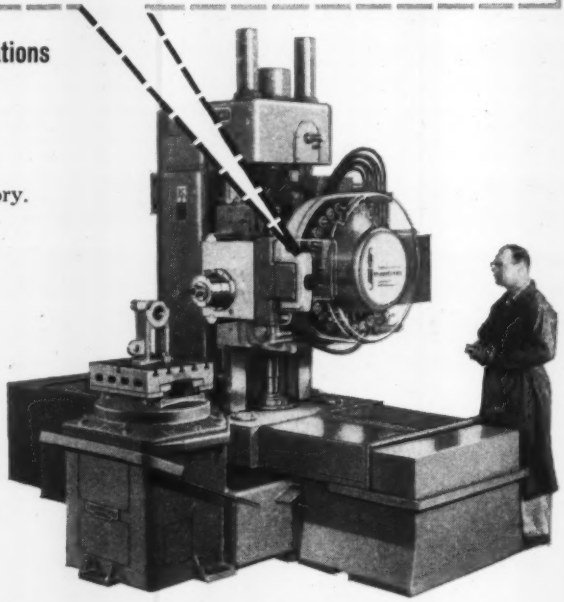


IN A MATTER OF SECONDS THIS EXCLUSIVE **MILWAUKEE-MATIC** FEATURE CHANGES YOUR PRODUCTION SCHEDULES FROM **MONTHS TO MINUTES!**

Here's what MILWAUKEE-MATIC means to your operations

- Offers flexible automation for job-lot producers through numerically controlled positioning, straight-line milling, arcs and slopes, tool selection, indexing and speeds and feeds.
- Cuts working capital requirements . . . balances inventory.
- Boosts machine cutting time by as much as 75% by applying off-machine workpiece set-up.
- Slashes tooling costs. . . savings can pay for MILWAUKEE-MATIC in one to three years.
- Reduces lead time from months to days . . . permits rapid new product introductions and product changes.

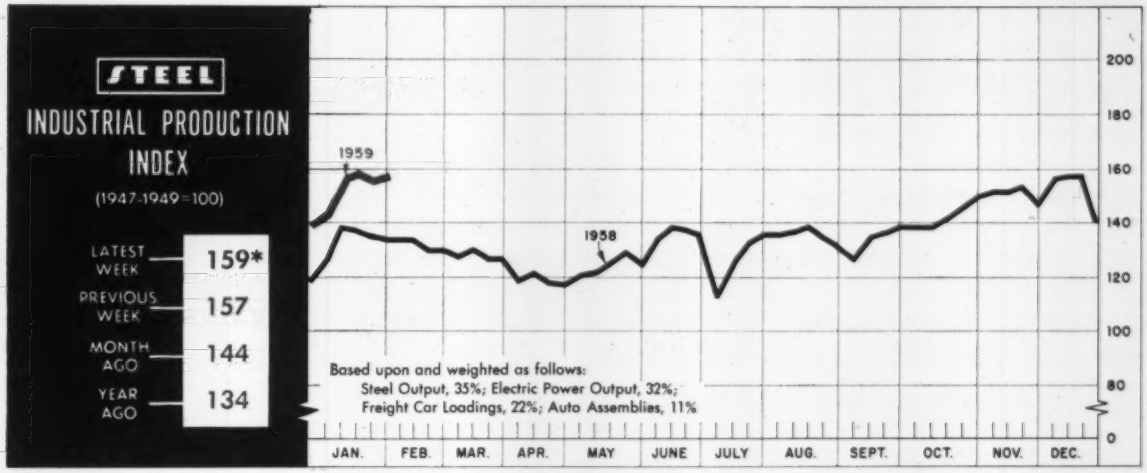
For free MILWAUKEE-MATIC film demonstration see your nearest Kearney & Trecker representative or write for free MILWAUKEE-MATIC Bulletin.



KEARNEY & TRECKER MILWAUKEE

Dept. KTNC • 6790 W. National Avenue • Milwaukee 14, Wisconsin

Designers and Builders of Precision and Production Machine Tools Since 1898



*Week ended Jan. 31.

Stocks Start Long Term Uptrend

YOU can expect manufacturers' inventory accumulation, which began slowly in October, to continue over the long term (three to four years), with the possibility of a brief leveling off or even a slight dip along the way.

• **Following Closely**—If the patterns of the last two business cycles hold —and there hasn't been much deviation so far—manufacturers' stocks will reach the previous high of $54.2 billion in 7 to 14 months. Because of the slow start, 14 months seems likely. Economists of New York's Chase Manhattan Bank say the present sales outlook indicates we can expect no more than $4 billion of inventory buying this year. (The latest figure puts manufacturing stocks at $49.3 billion, seasonally adjusted.)

In both the 1949-50 and 1953-54 periods, the liquidations were much sharper than the buildups. In 1949-50, it took producers 15 months to cut back 10.5 per cent after a three-year buildup. In 1953-54, a 7.4 per cent shrinkage took only 13 months. The buildup was longer, though—41 months. Two major factors: The Korean War and the long steel strike in 1952. The most recent inventory liquidation took place in 13 months after a buildup of 35 months. The cutback was 9 per cent.

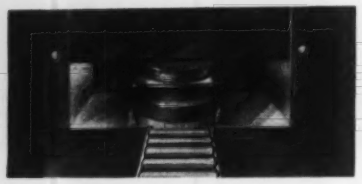
• **Some Differences** — The conditions that led to the previous uptrends are no longer present. Pent-up postwar demand is pretty well satisfied. The world is peaceful though nervous. Capacity is sufficient to meet normal demands. But there are other factors at work which will bring about the same results.

The slowness of the buildup does not stem from a lack of desire of manufacturers to add to their stocks. The Purchasing Agents Association of Cleveland Inc. reports that even though some members are starting to build steel stocks in anticipation of a strike, increased production has resulted in further depletion of raw

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,256[1]	2,178	1,457
Electric Power Distributed (million kw-hr)	13,300[1]	13,394	12,238
Bituminous Coal Output (1,000 tons)	8,015[1]	8,290	8,285
Crude Oil Production (daily avg—1,000 bbl)	7,200[1]	7,194	6,842
Construction Volume (*ENR*—millions)	$418.2	$388.1	$389.7
Auto, Truck Output, U. S., Canada (*Ward's*)	152,342[1]	159,893	130,961
TRADE			
Freight Carloadings (1,000 Cars)	560[1]	554	550
Business Failures (Dun & Bradstreet)	296	294	333
Currency in Circulation (millions)[3]	$31,150	$31,385	$30,625
Dept. Store Sales (changes from year ago)[3]	+5%	+5%	−3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,030	$26,294	$22,687
Federal Gross Debt (billions)	$286.5	$282.8	$275.0
Bond Volume, NYSE (millions)	$33.2	$34.7	$25.7
Stocks Sales, NYSE (thousands of shares)	18,719	19,298	10,754
Loans and Investments (billions)[4]	$95.6	$94.7	$86.5
U. S. Govt. Obligations Held (billions)[4]	$32.3	$31.2	$25.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	218.2	214.9	201.1
All Commodities[7]	119.5	119.6	118.7
Commodities Other than Farm & Foods[7]	127.4	127.4	125.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.



ONLY
OLIVER-FARQUHAR
makes both conveyors and hydraulic or mechanical presses

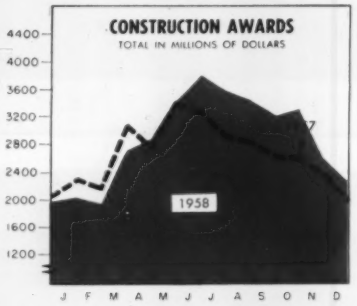
write The Oliver Corporation
A. B. FARQUHAR DIVISION
York 53, Pennsylvania

ALIVE TODAY!

Arch Lightbody is one of 800,000 Americans cured of cancer because they went to their doctors in time. They learned that many cancers are curable if detected early and treated promptly. That's why an annual health checkup is your best cancer insurance.

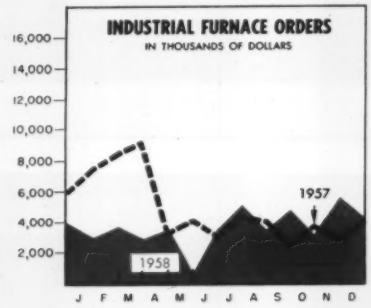
American Cancer Society

THE BUSINESS TREND



	Total 1958	Total 1957	Building 1958	Building 1957
Jan.	2,060.0	2,299.6	1,530.2	1,730.7
Feb.	1,953.4	2,161.0	1,478.1	1,695.5
Mar.	2,721.2	3,078.0	2,037.7	2,199.7
Apr.	2,881.0	2,776.4	2,198.0	2,069.7
May	3,402.6	3,399.5	2,470.3	2,416.8
June	3,819.6	3,243.5	2,340.3	2,341.5
July	3,607.1	2,900.7	2,633.5	2,247.6
Aug.	3,466.6	2,818.0	2,529.5	2,291.8
Sept.	3,215.9	2,624.9	2,352.5	2,092.2
Oct.	3,309.0	2,613.8	2,549.8	2,075.6
Nov.	2,593.9	2,370.7	1,980.8	1,808.5
Dec.	2,281.9	1,982.3	1,728.6	1,457.5
Totals	35,312.2	32,268.4	25,829.3	24,427.1

F. W. Dodge Corp.
Charts copyright, 1959, STEEL.



	1958	1957	1956
Jan.	3,047	8,775	13,719
Feb.	3,684	9,769	15,638
Mar.	2,871	10,485	10,500
Apr.	3,572	4,559	12,278
May	954	5,389	7,095
June	3,672	4,369	8,223
July	5,169	4,332	5,529
Aug.	3,533	3,924	8,110
Sept.	4,846	7,463	4,446
Oct.	3,105	3,674	10,129
Nov.	5,597	2,832	5,375
Dec.	4,284	3,992	7,237

Industrial Heating Equipment Assn. Inc.

materials. So orders are being stepped up, with the anticipation that stocks will rise during the rest of the first half.

• **Strike Effects**—Should there be a steel strike, stocks will be worked off quickly. Buying will be resumed after the settlement. It there is no strike, the steel industry will face a period of reduced buying until inventories are worked off to a level commensurate with orders. But some manufacturers will probably continue to build their product inventories—automobiles, appliances, and other durable goods.

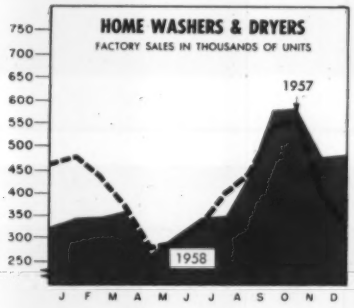
And about that time, a slow increase in capital goods demand should be causing those producers to lay in extra materials. The pickup in business in the first quarter is causing little worry about critical shortages, but some manufacturers are beginning to realize that they do not have as much overcapacity as they once thought. Old plans for expansion and modernization will come off the shelves to get the capital goods recovery started.

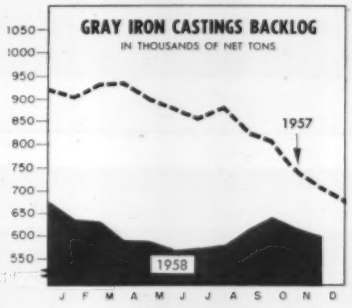
• **No Boom**—The development will not turn into a boom. In fact, it is even possible that inventories may level off or dip in 1960 or 1961. (It happened in both the 1952 and 1955 upturns.) But by then, the effects of the baby boom of the war years will be coming into full force, increasing demand for most goods and supporting an even higher inventory level. While history clearly warns us that another inventory recession is due about 1962, it may be moderated or warded off by this population increase.

Steel Holds Index Up

The prime reason STEEL's industrial production index is holding at a relatively high level is the strong showing of the steel industry—in response to improved business conditions and increased inventory buying.

After sliding off to 157 per cent of the 1947-49 base period in the storm and flood filled week ended Jan. 24, the index rebounded to 159, only a point shy of the previous high (see graph, Page 67). Steel operations are around 80 per cent of capacity, and indications are the rate will continue to climb. (Only six weeks ago, many industry officials predicted the high for the first half would be 80 per cent.) The industry is at its best weekly level (2.2 million tons of steel for ingots





	Washers		Dryers	
	1958	1957	1958	1957
Jan.	244,840	331,314	100,793	144,621
Feb.	268,143	319,580	79,683	114,517
Mar.	287,884	286,205	71,523	83,668
Apr.	224,896	230,675	38,475	42,850
May	262,999	262 430	41,898	32,846
June	288,831	289,245	54,173	47,696
July	277,287	340,915	75,513	70,440
Aug.	326,785	329,146	109,833	117,055
Sept.	423,073	392,733	158,733	166,473
Oct.	404,056	377,621	180,405	185,772
Nov.	333,035	260,460	142,499	141,663
Dec.	330,520	206,787	148,670	118,116
Totals	3,672,349	3,627,111	1,202,198	1,265,717

American Home Laundry Mfrs. Assn.

	Shipments		Unfilled Orders*	
	1958	1957	1958	1957
Jan.	868	1,213	638	905
Feb.	753	1,103	632	931
Mar.	796	1,133	590	935
Apr.	807	1,120	582	899
May	820	1,112	570	880
June	868	1,058	573	853
July	792	954	580	880
Aug.	802	1,076	614	826
Sept.	917	990	645	805
Oct.	993	1,100	620	740
Nov.	958	940	602	705
Dec.	...	864	...	676
Totals	...	12,663		

*For sale. U. S. Bureau of the Census.

and castings) since mid-June, 1957.

But it will take more than the steel industry to keep the index from going into a gradual decline in February. In four of the last five years that has been the seasonal pattern. Electric power output usually tapers off in late winter, and the auto industry is beginning to cut schedules now that inventory of new models is in the 40-day bracket.

If railroad freight carloadings respond to the improvement in general business conditions, they could help to minimize the seasonal downtrend. They are above the corresponding year-ago figures, and the margin is expected to widen.

Construction Booms Along

Construction shows no signs of wavering in its strong recovery. Contract awards tabulated by F. W. Dodge Corp. closed 1958 on a strong note, bringing the total for the year 9 per cent above the corresponding 1957 figure. (See graph and table, Page 68.)

The figures compiled by *Engineering News-Record* show that 1959 is beginning with equal vigor. The first five weeks of the year are 32 per cent above the corresponding period of 1958. *EN-R* reports that in the week ended Jan. 29, private contracts outpaced public projects for the first time in ten months.

Appliance Gains Forecast

After making a strong finish in the latter half of last year (see graph and table for home laundry equipment above), the appliance industry is heading for a 5 per cent increase in 1959, declares William C. Wichman, vice president of General Electric Co. and general manager of the Hotpoint Div. About 13 million units will be sold, climbing to 16.5 million in 1963, 20.5 million by 1968, an increase of 63 per cent over the present selling rate. "That means some 50 million consumers will be spending $40 billion just for new kitchen-laundry appliances," he says.

Trends Fore and Aft

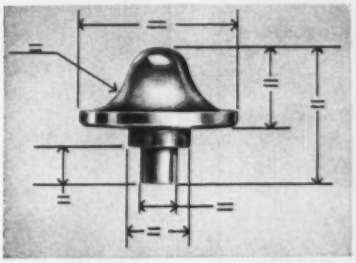
• Used machine tool sales in December outpaced November by 10.5 per cent and December, 1957, by 54.2 per cent, says Machinery Dealers National Association.

• Gear sales in December declined 20 per cent to 145.5 (1947-49 = 100), according to American Gear Manufacturers Association.

IT PAYS TO HAVE HUBBELL GOOD CONNECTIONS

Manufacturers of Cold Headed Fasteners Since 1888

OVER **10** TIMES THE RATE AT **50%** SAVING IN RAW MATERIAL



Another example of how Hubbell Cold Heading produces Better Parts at Faster Speeds, at Lower Cost

THE PART:
Click Button

THE MATERIAL:
Brass

THE METHOD:
Hubbell cold heading in place of screw machining.

THE RESULT:
This brass click button was machined previously from bar stock, involving several different operations that removed nearly 50% of the total weight of the original stock . . . a wasteful, time-consuming, costly process.

Hubbell now produces essentially the same part at tremendous savings in time and material cost.

a. Production is increased from the original rate of 5.5 pcs. p.m. to cold heading rate of 60 pcs. p.m.

b. Labor, overhead and material cost has been reduced 36%.

c. The finished part is stronger, more accurate, with greater uniformity.

Hubbell Cold Heading may provide equally dramatic results for you. Whether it is presently cold headed or not, send blueprint of part or sample for analysis and estimate.

HARVEY HUBBELL, Inc. *Machine Screw Dept.*
Bridgeport 2, Connecticut

Kindly estimate on the enclosed sample (blueprint) Quantity _____

Name _____
Title _____
Company _____
Address _____

Good bet: You're paying for lubricants you don't need

Does this case sound familiar to you?

A midwest firm was buying lubricants on the recommendation of every department head, foreman or even operator. Inventory — often duplicated — was scattered all over the plant, yet shortages in one spot were never related to overstocks in another. The result: costly overstocking, extra handling, increased dangers of misapplication.

Management realized they had a problem — instituted an Organized Lubrication Plan. Now they use 20 lubes instead of 97, have cut their purchase orders from 300 to 12 per year. Direct savings are estimated at thousands of dollars annually.

Can Organized Lubrication save money in your plant? Contact your local Texaco Engineer or write for:

"Management Practices that Control Costs via Organized Lubrication."

The Texas Company, 135 East 42nd Street, New York 17, N. Y., Dept. S-80.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

TUNE IN . . . Metropolitan Opera
Radio BROADCASTS
every Saturday afternoon

WALLACE S. WHITTAKER
P&W exec. committee chairman

EDWARD F. WHITNEY
Sealol manufacturing v. p.

JOHN B. KNAEBEL
heads Anaconda Iron Ore (Ont.)

A. J. McMULLEN
Garlock Packing president

Wallace S. Whittaker, formerly a production executive with General Motors Corp., was elected chairman of the executive committee of **Pratt & Whitney Co. Inc.,** West Hartford, Conn., subsidiary of Penn-Texas Corp. He also was elected chairman of **Potter & Johnston Co.,** a P&W subsidiary.

Edward F. Whitney was named manufacturing vice president of **Sealol Corp.,** Providence, R. I. He was general manager of Sealol Mfg. Co., Keene, N. H., recently discontinued subsidiary.

J. David Hopkins was made general sales manager, **Delavan Mfg. Co.,** West Des Moines, Iowa. He was regional sales manager-south central for General Electric Co.'s Distribution Assemblies Div.

William D. Mathers was named manager of forging sales, **Aluminum Co. of America,** in Cleveland. He succeeds **William C. Woodward,** named manager of aircraft and missiles sales, Pittsburgh. **Lewis P. Favorite,** manager of product sales for Alcoa, was elected a vice president in charge of product sales and distribution, succeeding **Donovan Wilmot,** retired.

Samuel W. Off was made assistant manager, tin plate products, **U. S. Steel Corp.,** Pittsburgh. He was assistant sales manager, Boston district.

Samuel W. Keith was made manager of industrial relations for **Atkins Saw Div.,** Indianapolis, Borg-Warner Corp.

John B. Knaebel was appointed president and managing director of **Anaconda Iron Ore (Ontario) Ltd.,** subsidiary of Anaconda Co. (Canada) Ltd.

William D. Fullerton was made assistant general manager; **William L. Fabianic,** director of research at Refractories Div., **H. K. Porter Company Inc.,** Pittsburgh. Mr. Fullerton was assistant to the president. He joined Porter in 1957, and was previously vice president, U. S. Motors, Oshkosh, Wis.

Robert C. Palmer was elected president, **Ingalls Iron Works Co.,** Birmingham. He was executive vice president. **Frederick J. Mayo** was elected president, **Ingalls Shipbuilding Corp.,** to succeed **W. R. Guest,** retired. **John P. Coakley,** manager - Washington office, Ingalls Shipbuilding, was elected a vice president of that subsidiary.

Carl E. Pfeiffer was elected vice president, **Gulf States Tube Corp.,** Rosenberg, Tex., subsidiary, Michigan Seamless Tube Co.

Elmer J. Perry fills the new post of manufacturing manager, Semiconductor Div., Woburn, Mass., **Sylvania Electric Products Inc.** He was manager of the semiconductor plant at Hillsboro, N. H.

William A. Baldwin was made vice president, transportation products sales, **Stran-Steel Corp.,** Detroit, division of National Steel Corp. He continues direction of development and sale of components for the railroad industry.

Garlock Packing Co., Palmyra, N. Y., elected **A. J. McMullen** president and principal executive and administrative officer. Former vice president, he succeeds **Robert M. Waples,** who was elected chairman to succeed **George L. Abbott,** retired. Mr. Abbott remains a director and chairman of the executive committee.

Thomas H. Pearce was elected president, **National-Standard Co.,** Niles, Mich. He succeeds **A. H. Johnson,** who joins **Walter H. Parkin** as co-chairman. **William D. Peace** was made vice president-rubber industry sales; **Richard W. Elder,** vice president-specialty sales.

Frank Lopez, formerly with General Electric Co., joined **Boston Electro Steel Casting Inc.,** Boston, as vice president. **Frank McCorry** was made vice president-plant manager; **Jack Murray,** vice president-production.

John W. Hammond, former general sales manager, was made assistant director of engineering, **Friez Instrument Div.,** Baltimore, Bendix Aviation Corp. **Russell B. Stevenson,** former manager of special products sales, succeeds Mr. Hammond.

Henry F. O'Shaughnessy was made works manager of Chase Metal Works, Waterbury, Conn., **Chase Brass & Copper Co.,** a subsidiary of Kennecott Copper Corp. He was general superintendent. **Paul M. Thomas,** midwestern regional manager for Chase Brass, was made manager of mill sales at Water-

CHARLES R. LAIR
Chambers Mfg. gen. mgr.

STUART K. BABCOCK
heads Babcock Radio Eng.

ALAN SELIGSON
new post at Tube Distributors

CLOYD L. BETZER
Pfaudler technical mgr.

bury. He is succeeded in Chicago by **Wallace L. Brown.**

Charles R. Lair was made general manager, **Chambers Mfg. Corp.**, Oxford, Miss. He was with Avco Mfg. Corp's American Kitchen Div.

Stuart K. Babcock, former executive vice president, was elected president, **Babcock Radio Engineering Inc.**, Costa Mesa, Calif. **Ferris M. Smith,** former president, was elected to the new post of chief executive officer and chairman.

L. G. Probst was named vice president and eastern district manager, **National Engineering Co.**, Chicago. **W. A. Kellogg,** who has supervised the eastern district for many years, will continue with the company as a vice president and consultant on foundry planning and material planning.

Robert H. Workman was made manager of **Congdon & Carpenter Co.'s** Fall River, Mass., plant. He replaces **Donald H. Bump,** recently promoted to vice president.

Rex C. Corns was made general superintendent, Gary, Ind., plant, National Tube Div., **U. S. Steel Corp.** He succeeds **Paul C. Ely,** recently promoted to assistant vice president-operations in charge of tubing specialties manufacturing. **Harold E. Hobe** succeeds the late **G. G. Erland** as chief engineer of the corporation's Johnstown Works, Johnstown, Pa. Mr. Hobe was superintendent-maintenance shops, Edgar Thomson Works. **Phillips Hawkins** was appointed vice president-international and raw materials-staff, Pittsburgh.

Alan Seligson was named to the new post of executive assistant to the president of **Tube Distributors Co. Inc.**, Garden City, N. Y. He is responsible for all line and staff operations.

Walter G. Haas was made general sales manager-Cleveland operation of **Nottingham Steel & Aluminum Co.**, division of A. M. Castle & Co.

Richard C. Cole, vice president, was named president of **Vitro Uranium Co.**, Salt Lake City, Utah, division of Vitro Corp. of America. He succeeds **William B. Hall,** promoted to vice president, parent firm, New York, in charge of chemical and metallurgical operations.

Rudolph Kustra was named assistant to vice president-production, **Carlon Products Corp.**, Aurora, Ohio. He was production manager.

William M. George was made operations manager, **Drop Forge Div.**, Duff-Norton Co., Pittsburgh. He was sales manager.

Cloyd L. Betzer was made technical manager of **Pfaudler Co.**, division of Pfaudler Permutit Inc. at Rochester, N. Y. With the exception of production and industrial engineering, he is responsible for Pfaudler engineering, research, and development.

Howard G. Fillhower joined **American Machine & Foundry Co.**, New York, as director of industrial relations. He was manager-industrial relations with Tidewater Oil Co.

Renald W. Frederick, assistant sales manager, brass mill products, for **Bridgeport Brass Co.**, Bridgeport, Conn., was made assistant to the president.

Delta-Star Electric Div., H. K. Porter Company Inc., appointed **J. F. Zboyovsky** sales manager of its Thomas Works, Lisbon, Ohio. **W. C. Carpenter** was made assistant to the manager, Thomas Works.

Structural Fibers Inc., Chardon,

REX C. CORNS

PHILLIPS HAWKINS

HAROLD E. HOBE

U. S. Steel Corp. appointments

*For Heat Treating Equipment**

Nothing Beats **Ingersoll** Heat Resisting Stainless

What do *you* make that might be made *better* with Ingersoll heat resisting stainless steel? *Electric furnace liners? *Annealing baskets and trays? *Retorts? *Furnace boxes and carburizing boxes? *Other heat treating equipment?

If it calls for heat resisting stainless steel, call on Ingersoll for your needs. Ingersoll heat resisting stainless is scientifically formulated to provide maximum strength and durability under high operating temperatures. And it has exceptional forming characteristics for easy fabrication into the shapes you require.

What's more, when you specify Ingersoll heat resisting stainless steel you get *customized* service. Production schedules set up to meet *your* requirements. Sheet and plate to your exact analysis, size and gauge specifications. Quality control that assures uniform high quality. On-time, as-promised deliveries to meet your own production needs.

If you use heat resisting stainless, nothing beats Ingersoll . . . or Ingersoll service. Try us, and see.

INGERSOLL STEEL B-W BORG WARNER

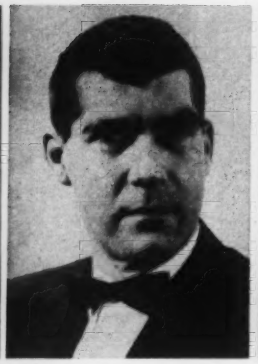
Ingersoll STEEL DIVISION

Borg-Warner Corporation

NEW CASTLE, INDIANA

1884 *75 YEARS* 1959

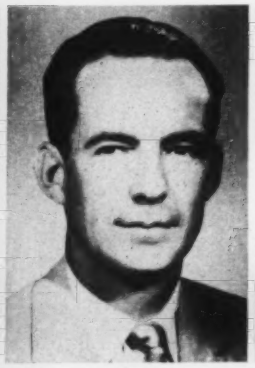
J. M. DOHR
Moloney Electric v. p.



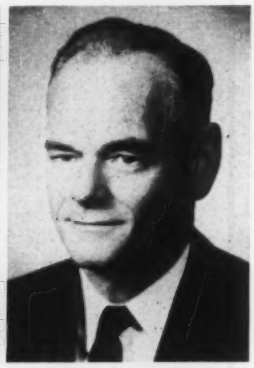
BERNARD J. O'NEILL
Magnetic Amplifiers v. p.

DONN K. KAUFFMAN
Ceilcote plant manager

E. P. BEST
Byers metallurgy-research dir.



G. V. PATTERSON
Swartwout vice president



MICHAEL L. BERNSTEIN
Wheeling Steel chief engineer

Ohio, appointed **Robert Gelin** assistant to vice president.

E. P. Best was appointed director of metallurgy and research, **A. M. Byers Co.**, Pittsburgh. **T. D. Bonner** was made chief wrought iron metallurgist. Former chief metallurgist, Mr. Best now heads metallurgical, chemical, and research departments.

G. V. Patterson was elected vice president, **Swartwout Co.**, Cleveland. He continues as manager, Ventilator Div.

Frank J. Zupancic was named superintendent, Electrical Dept., at the Warren, Ohio, plant of **Republic Steel Corp.** He succeeds **J. S. Rinda**, retired. **John J. Yonakor** succeeds **W. T. Dobson**, retired, as superintendent, General Labor Dept., Cleveland steel plant.

Robert E. Miller was made purchasing agent of **Datalab Div.**, Pasadena, Calif., Consolidated Electrodynamics Corp.

Michael L. Bernstein was named chief engineer, **Wheeling Steel Corp.**, Wheeling, W. Va. He was assistant general manager, Steubenville Works.

John E. Wennogle was promoted to export manager, New York, for **Hubbard & Co.**

Kenneth G. Hockanson was made director of research and development, **H. M. Harper Co.**, Morton Grove, Ill. **Charles L. Harper** was made plant superintendent, Metals Div.

Jack Keller was made assistant to the general manager, Industrial Sales Div., **Western Machinery Co.**, San Francisco. His office is in Phoenix, Ariz.

Jean J. Grunwald was named research chemist of **MacDermid Inc.**, Waterbury, Conn.

John K. Kuenzig was named superintendent, Brier Hill Coke Plant, **Youngstown Sheet & Tube Co.**, Youngstown. He succeeds **Elwyn T. Gants**, retired.

J. M. Dohr, manager, Power Production Dept., was promoted to vice president-production for **Moloney Electric Co.**, St. Louis. He replaces **C. G. Duenke**, resigned. **G. T. Wootten**, former assistant superintendent of the company, fills the new post of plant manager.

Bernard J. O'Neill was named to the new post of vice president-engineering, **Magnetic Amplifiers Inc.**, New York. He was chief engineer.

Donn K. Kauffman was made plant manager, Plastics Div., **Ceilcote Co.**, Cleveland. He had former association with Fruehauf Trailer Co., and Cleveland Tank Div., General Motors Corp.

M. L. Mandeville was named vice president and director of sales, International Div., **U. S. Industries Inc.**, New York. He was assistant general sales manager, Overseas Div., Continental Can Co.

Patrick L. McManus was made assistant manager-Marketing Div., and eastern regional sales manager of **Worthington Corp.**, at headquarters, Harrison, N. J. He is replaced as San Francisco district manager by **William M. Fine**, former manager, Minneapolis district office.

Zolly C. Van Schwartz was made technical consultant for **C. A. Norgen Co.**, Englewood, Colo., and subsidiary, Norgren-Stemac Inc. He was director of engineering standards for Baldwin-Lima-Hamilton Corp.

Kerwin F. Kelly was made assistant to the president of **Martin Steel Corp.**, Mansfield, Ohio.

OBITUARIES...

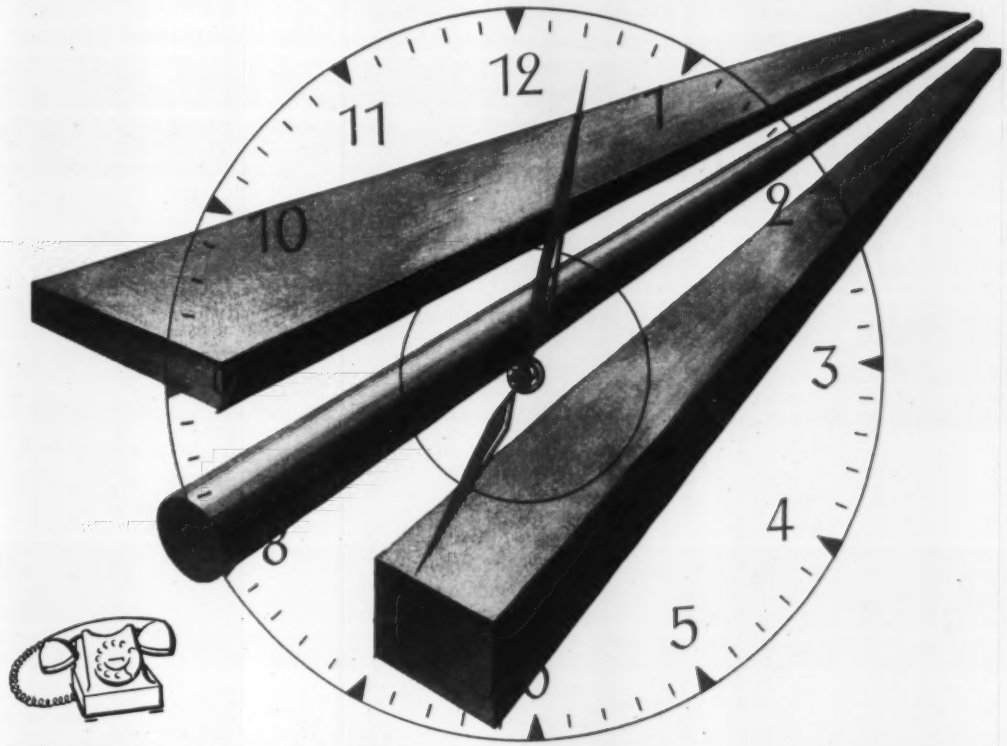
A. F. Fisher, general manager, Johnstown, Pa., plant, **Bethlehem Steel Co.**, died Jan. 30.

Pat Leone, 49, vice president, **Gabriel Co.**, Cleveland, died Feb. 1.

E. E. Smith, 45, sales manager and assistant secretary, **Synthane Corp.**, Oaks, Pa., died Jan. 27.

Firth Sterling ...

PIONEER IN POWDER AND MOLTEN METALLURGY



HOW FAST do you need the toughest oil-hardening tool and die steel ever made?

INVARO is available—for fast delivery—from Firth Sterling warehouse and distributor stocks of drill rod and ground flat stocks in all practical sizes. It offers tool and die makers consistent uniformity, better hardenability and greater safety in hardening—does a better job in a broad range of applications.

And the INVARO "Twins"—ground flat stock and drill rod—may be heat treated in the same furnace at the same time, exhibiting the same minimum dimensional changes. The resulting savings in time and production can be substantial. For further information, write for free technical bulletin.

INVARO oil-hardening tool and die steel is just one of the many types of electric furnace quality tool steels produced by Firth Sterling. These high quality tool steels are the result of Firth Sterling's continued research and development to provide specialty steels for use in the important tool and die industry.

* * *

If you have a metallurgical problem, powder or molten, we have the answer for it. Please let us hear from you. Firth Sterling, Inc., Dept. 81B, 3113 Forbes St., Pittsburgh 30, Pa. Offices and warehouses in principal cities.

"Your Future is Great in a Growing America"

PRODUCTS OF Firth Sterling METALLURGY

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
SINTERED TUNGSTEN CARBIDES • HEAVY METAL • CERMETS • CHROMIUM CARBIDES
ZIRCONIUM • STERVAC & STERCON SUPER ALLOYS

FIRTH STERLING TRADE MARK

Firth Sterling Acquires Kellogg's Alloy Steel Melting Business

FIRTH STERLING INC., Pittsburgh, is broadening its activities in the high temperature metal field. It has purchased the specialty alloy steel manufacturing business of M. W. Kellogg Co., New York, a subsidiary of Pullman Inc.

Alloys produced by the Kellogg process (renamed Hopkins) are used widely in the aircraft and related industries. Officials hope to extend the market to missiles, gears, valves, high speed and tool steels. They have been available only as 8 to 15 in. ingots, weighing up to 3000 lb.

By integrating the process with its own steel mill facilities, Firth Sterling is offering structural alloys for aircraft, as well as high temperature alloys.

• **Wider Application** — Production plans call for melting alloys in Firth Sterling electric arc furnaces. The alloys will be remelted by the newly acquired process under the refining flux, producing ingots which may be forged and rolled into mill products, such as billets and hot and cold finished bars.

The company does not expect to install any additional finishing equipment at this time, says Kenneth D. Mann, president. For the present, Firth Sterling will continue the operation at the Jersey City, N. J., plant without interruption to production and shipping schedules. The plant has six furnaces with an annual capacity of 5000 tons a year. Construction of a consumable electrode type furnace in the Pittsburgh area is under consideration. Firth Sterling has two electric arc and one electric induction furnaces with an annual capacity of 20,040 tons.

Warren L. Smith, president of the M. W. Kellogg Co., says that the sale will have no effect on its research and development laboratories or the Kellogg manufacturing and fabricating facilities for process equipment and power piping at Jersey City.

Buys Lathe, Miller Line

Black Rock Mfg. Co., Bridgeport, Conn., purchased the entire line of Reed-Prentice lathes and millers from Package Machinery Corp., East Longmeadow, Mass. The Reed-Prentice names will be retained for the machine tool line.

McKey Firm Expands

McKey Perforating Co. Inc., Milwaukee, purchased the metal manufacturing facilities of Strauss-Frank Co., Houston. This gives McKey an important entry into the perforated metal market in the Southwest and will boost its annual sales by about two-thirds, says Douglas McKey, president.

Morrison Reorganizes

Morrison Railway Supply Corp. and International Railway Car Leasing Co., Buffalo, have been reorganized into one company and three affiliates. Morrison Railway Supply Corp. will continue to handle repair of railroad frogs, switches, and track in place; reconditioning of rails; and the purchase and sale of railway rolling stock and track material. M. L. Morrison is executive vice president.

The three affiliates are: Morrison Industries Inc. (George Kass, president), manufacturing operations; Morrison Plan Inc. (Seymour Feldman, president), leasing of new railroad maintenance equipment; and International Railway Car Leasing Co. (R. L. Morrison, president), leasing of reconditioned revenue freight cars.

Expands Ferroalloy Plant

Ohio Ferro-Alloys Corp., Canton, Ohio, has doubled facilities for production of calcium-silicon and calcium-manganese-silicon at its Philo, Ohio, plant. The alloys are produced in a continuously charged electric furnace.

Plans Memphis Warehouse

United States Steel Corp.'s U. S. Steel Supply Div. will build a steel service center at Harbor Avenue and Dock Street, President's Island, Memphis, Tenn. The 40,000 sq ft facility will offer a complete line of steel and steel strapping materials and equipment. It will be operated in conjunction with the division's district service center in Birmingham.

Powell Acquires Line

Powell Pressed Steel Co., Hubbard, Ohio, acquired a semibulk handling system from Delta Tank Mfg. Co. Inc., Baton Rouge, La. Lewis W. Lubenow is field sales manager for Powell's Semi-Bulk Materials Handling Div.

Modernizes Coast Plant

An 18-month plant modernization program at United States Steel's U. S. Steel Products Div. at Los Angeles is underway. Wooden buildings (covering 50,000 sq ft of factory space) are being replaced with a steel structure and about 60,000 sq ft of production space is being added. Production lines will be realigned and plant layout will be streamlined. Products made at the plant include: Steel containers, wheelbarrows, galvanized ware, and garden tools.

Starrett Forms Gage Div.

L. S. Starrett Co., Athol, Mass., formed a new Gage Div. with manufacturing, engineering, and sales facilities to design and build complete special gaging equipment. The company has moved its Chicago branch office and warehouse to 4949 W. Harrison St. W. W. Haskins is western sales manager. Products include saws and ground flat stock.

Page-Hersey Broadens Line

Page-Hersey Tubes Ltd., Toronto, Ont., will start producing copper tubing soon. The firm expects eventually to produce pipe and tubing made of aluminum and alloy steels. It has been granted exclusive Canadian rights by New Rochelle Tool Corp., New Rochelle, N. Y., for the use of a high frequency welding technique to produce welded pipe and tubing on a high speed production basis. Page-Hersey has two New Rochelle welding units and production of copper tubes will commence as soon as a new forming and sizing mill arrives at its plant at Welland, Ont.

Boosts Vanadium Supply

Facilities for the production of high purity vanadium have been tripled at the Fine Metals & Chemicals Dept. (Niagara Falls, N. Y.) of Union Carbide Metals Co. The division of Union Carbide Corp. says that demand for ductile vanadium is increasing rapidly.

NEW PLANTS

Air Reduction Sales Co., a division of Air Reduction Co. Inc., New York, completed a facility for the production of oxygen and nitrogen at 1100 Packard St., Kansas City, Kans. It replaces the plant at 1000 W. 26th St., that city.

Gate City Steel Inc., Denver, purchased a 70,500 sq ft plant at Berkeley, Calif., to house operations of its recently acquired subsidiary, Moffett Engineering Inc. The plant was formerly owned by Yuba Consolidated Industries Inc. Moffett makes heavy duty cranes.

Bettinger Corp., Milford, Mass., moved into its $1.5 million building which is equipped for production of ceramic-on-metal products. The plant contains 100,000 sq ft of floor space.

Chance Vought Aircraft Inc., Dallas, has placed in operation its $1 million hydraulic research and manufacturing facility. The 20,000 sq ft plant is equipped to produce precision cylinders, pumps, valves, and servosystems.

Kahle Engineering Co., builder of automatic and semiautomatic machinery for the electronic, glassworking and other industries, moved into its enlarged plant at 3322 Hudson Ave., Union City, N. J.

Two-way radio systems designed by **General Electric Co.**, Schenectady, N. Y., will be produced in a new factory at Lynchburg, Va., where the Communication Products Dept. is establishing its headquarters.

I-T-E Circuit Breaker Co., Philadelphia, will open a major warehouse this spring in the San Francisco area to handle sales and service of its low voltage electrical equipment. A $300,000 building is being constructed in South San Francisco's Lindenville Industrial Park.

Newcomb Spring of Connecticut Inc., Southington, Conn., opened a springmaking plant at 1200 Spring St. N.W., Atlanta, Ga. Charles R. Porter is general manager of Newcomb Spring of Atlanta. He has been succeeded as sales manager of the Connecticut factory by William Histon.

NEW OFFICES

Detroit Steel Corp., Detroit, moved its district sales office to 524 Maxwell Ave., Cincinnati 19, Ohio. E. P. McPhelin is manager of sales at that office.

Clark Controller Co., Cleveland, established its Detroit district office at 15830 W. Seven Mile Rd. An incorrect street number was given in a previous announcement (STEEL, Jan. 26, p. 45).

Delta-Star Electric Div., H. K. Porter Company Inc., Chicago, established a district office at 3400 N. Meridian St., Indianapolis 8, Ind. Roy E. Daub is district manager.

CONSOLIDATIONS

Green Fuel Economizer Co. Inc., Beacon, N. Y., acquired **Bayley Blower Co.**, Milwaukee, maker of industrial and ventilating fans, humidifiers, and heating coils. Green Fuel makes cast iron fuel economizers, heavy duty fans, air filters, and industrial heat collecting systems. Frank J. Hamilton has been elected president of Bayley Blower Co.

Roto-Finish Co., Kalamazoo, Mich. (precision barrel finishing machinery), purchased Ransohoff Inc., Hamilton, Ohio (metal finishing, phosphating, pickling, and paint finishing systems; foundry equipment; and automated combinations of this equipment).

ASSOCIATIONS

Louis F. Fontana, Irving Subway Grating Co. Inc., Long Island City, N. Y., has been elected president of the **Metal Grating Institute**, Pittsburgh.

National Constructors Association, New York, elected these officers: President, W. R. Wood, Chemetron Corp., Louisville; and vice president, D. W. Darnell, Fluor Corp. Ltd., Los Angeles. New members of the executive committee are: Mr. Darnell; R. L. Cashen, H. K. Ferguson Co., Cleveland; W. Earl Dunn, Blaw-Knox Co., Pittsburgh; and J. W. Smith, M. W. Kellogg Co., New York.

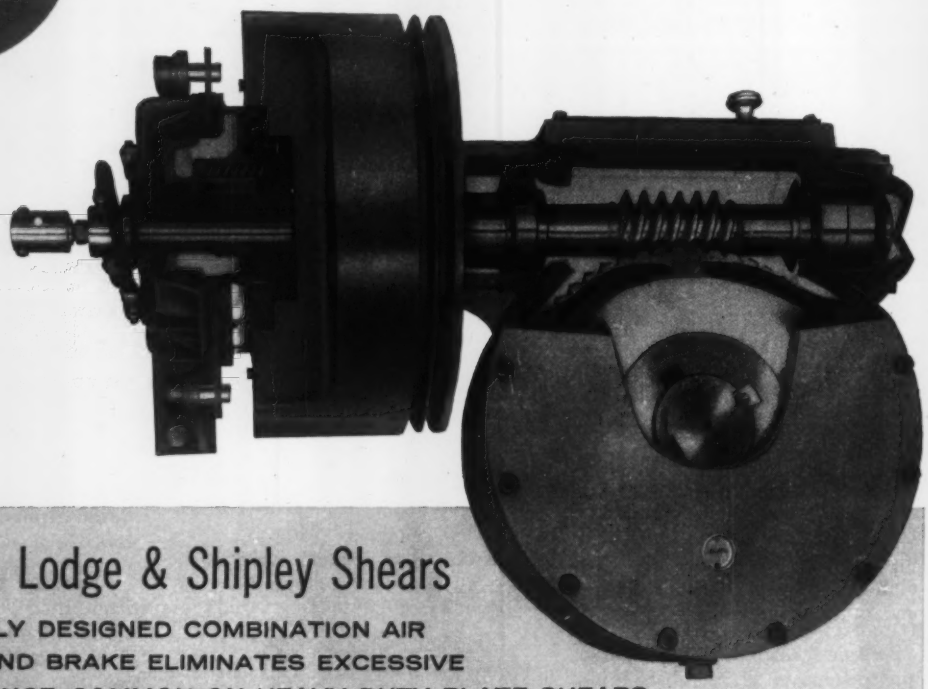
Richard D. Hannan has been appointed executive secretary of the **Industrial Instrument Section, Scientific Apparatus Makers Association**, Chicago.

American Institute for Imported Steel Inc., New York, re-elected these officers: President, Herbert Winter, Winter, Wolff Co.; vice president, A. A. Franck, Indussa Corp.; secretary-treasurer, J. L. Wilmotte, Joseph L. Wilmotte & Co. Inc., all of New York. Kurt Orban, Kurt Orban Co. Inc., Jersey City, N. J., and C. Stern, J. Gerber & Co. Inc., New York, were elected vice presidents.

Compressed Gas Association, New York, elected these officers: President, Claude E. Monlux, Linde Co., a division of Union Carbide Corp., New York; first vice president, G. C. Cusack, Pure Carbonic Co., a division of Air Reduction Co. Inc., New York; second vice president, D. M. Horner, Harrisburg Steel Co., a division of Harsco Corp., Harrisburg, Pa.; and secretary-treasurer, F. R. Fetherston.

Industrial Heating Equipment Association Inc., Washington, elected these officers: President, R. L. Harper, Harper Electric Furnace Corp., Buffalo; vice president, W. E. Benninghoff, Ohio Crankshaft Co., Cleveland; and treasurer, Roy R. Snyder, W. S. Rockwell Co., Fairfield, Conn. Robert E. Fleming was re-elected executive vice president.

EXTRAS on the machine . . . not on the invoice!



Only on Lodge & Shipley Shears

...SPECIALLY DESIGNED COMBINATION AIR CLUTCH AND BRAKE ELIMINATES EXCESSIVE MAINTENANCE COMMON ON HEAVY DUTY PLATE SHEARS

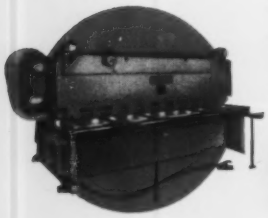
The "standard extras" you find on Lodge & Shipley Shears, although not reflected in the price, are important in time-saving, effortless operation, accuracy and low-cost service.

THE COMBINATION AIR CLUTCH AND BRAKE, for example . . . its single unit design positively eliminates overlap between clutch and brake. Disc-type construction is self-adjusting for fast, smooth starting and safe, positive stopping. The clutch provides automatic overload safety; the brake applies automatically in the event of electrical or air supply failure.

NO OTHER SHEAR, EVEN AT EXTRA COST, can offer the exclusive combination of features found, for instance, on the ½" Lodge & Shipley Shear:

• 2-stage Hydraulic Holddown System • Remote-operating Foot Control • Motorized Front-Operated Back Gauge • One-piece Shaft with Integral Eccentrics • Ball Transfer Table • Blade Clearance Indicators • Air Counterbalances • Air-cushioned Back Gauge • Blade Changing Jigs • Fast, One-man Upper Blade Adjustment • Independent Holddown Fingers • Quad-life Worm Gear.

Find out how much more you get . . . **WITHOUT EXTRA COST** . . . on a Lodge & Shipley Shear. For details, see Sweet's Machine Tool File or request Bulletin No. PS-15 from: **The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.**



Capacities to ½" x 12'

Lodge & Shipley Your LODGE-ical Choice!

RUSSIAN TECHNOLOGY—Ultrasonic vibration applied during casting and solidification produces superfine structures with "remarkable" qualities, reports a Czech source. Melts are exposed to vertical ultrasonic vibrations of around 20,000 cycles per second and horizontal vibrations some ten times higher. Dendrites formed during solidification are broken up, imparting a superfine, ordered crystalline structure to castings. (They're for rockets.)

PROGRESS IN PORCELAIN ENAMEL—One coat, low temperature porcelain enamels will be commercially feasible in less than three years, says Harry T. Marks, president, Ferro Corp., Cleveland. They will fuse to steel at temperatures (1250° F) well below the softening point of steel, making it possible to coat practically any shape, he says. Cost: About the same as an organic coating.

CADMIUM COAT ISN'T BRITTLE— A new way to vacuum deposit cadmium on high strength steels eliminates the problem of hydrogen embrittlement, says NRC Equipment Corp., Newton, Mass. Deposit cost and quality compare favorably with electroplating. A modified version of a standard decorative metallizer does the work. Flexed samples passed a 96 hour salt spray test with no trace of corrosion. In one bend test, the substrate failed before the coating.

LARGE ROLL FORMER— A new Hufford machine can cold form heavy stainless steel parts 5 ft long and 5 ft in diameter while reducing the cross section 1 in. to ½ in., says Gen. B. H. Warren, Aeronautical Systems Center, Wright-Patterson Air Force Base, Ohio. Developed under an Air Force contract, it will reduce the cost of making parts for the Bomarc interceptor missile.

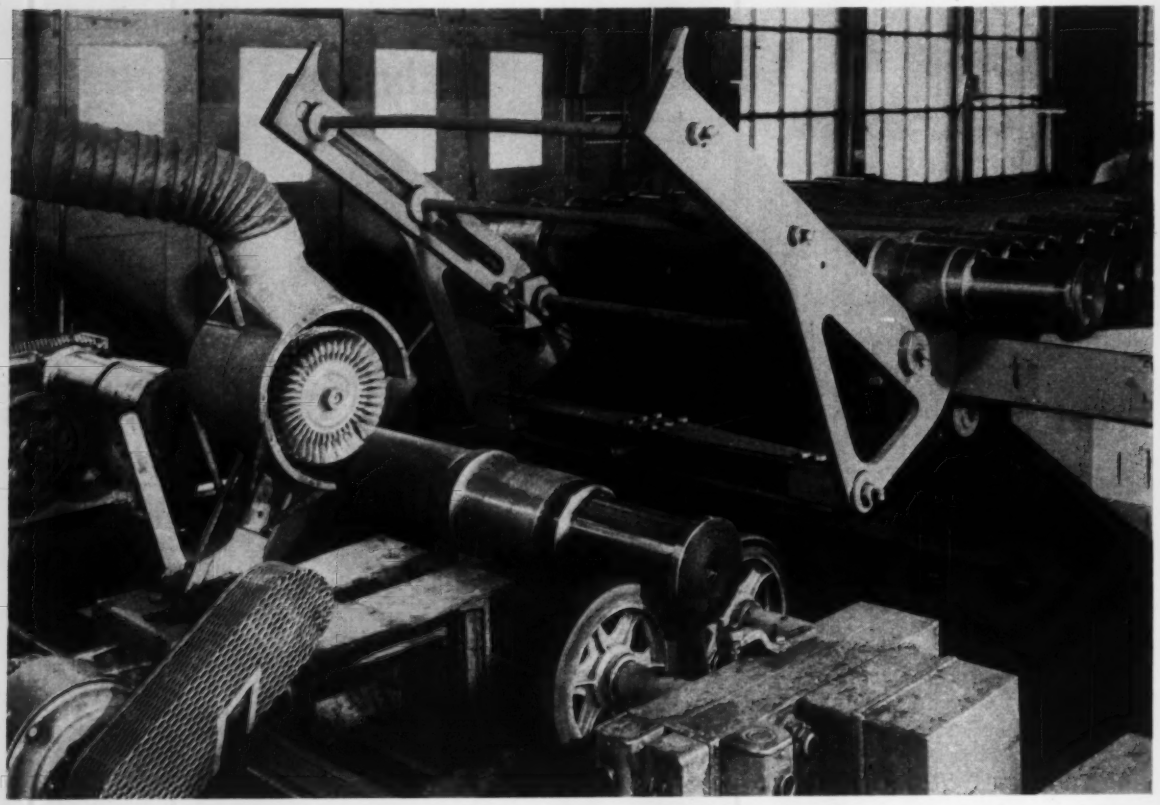
CRACK RESISTANT WELD—Two new ferritic filler wires containing manganese, nickel, molybdenum, and vanadium have been developed by the Battelle Memorial Institute, Columbus, Ohio, for use with the inert gas shielded, consumable electrode (Mig) processes. Deposits show increased resistance to cracking and improved notch toughness. They're comparable to those made by low hydrogen iron powder electrodes. You can get a copy of the Army sponsored report from OTS, Department of Commerce, Washington, D. C. (PB 131689-$1).

LONGER CARBIDE TOOL LIFE— A mirror finish on cemented carbide tool inserts increases life about 20 per cent, says Allegheny Ludlum Steel Corp., Pittsburgh. Reason: Metal cuttings slide away from the cutting edge more quickly. The firm's own product—Carmet—will be marketed with that kind of finish, obtained by polishing with a superfine wheel.

IMPROVES CARBIDE BRAZES— A film of cobalt about 100 microinches deep on the surface of a carbide blank increases wettability for brazing and eliminates the need for surface blasting with aluminum oxide, says National Twist Drill & Tool Co., Rochester, Mich. It has developed a leaching method for resurfacing the carbide with cobalt which acts as a bonding agent. Strength of the bond is said to be much improved. You can get samples by writing the firm's research and development department.

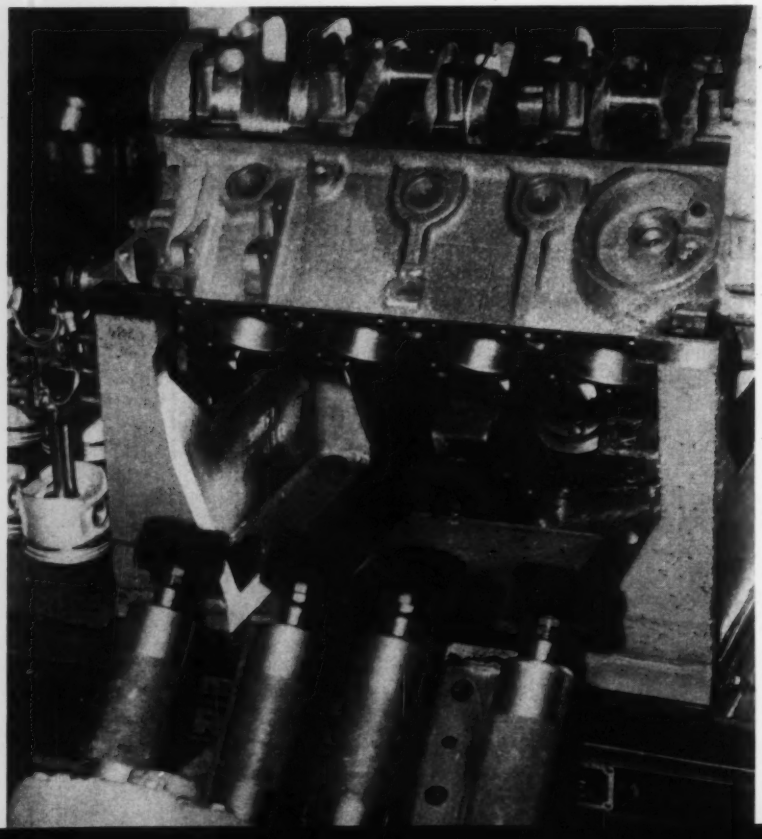
HEAT-LIGHT SOURCE—Next time you want to heat and light an area you might consider General Electric's quartz, infrared tube-lamps. The firm reports the idea has been successful in two special applications. In one, a repair shop used radiant heat to offset drafty conditions and provide light for the workmen.

STRONGER CONCRETE REPAIRS— A new combination of epoxy and nylon resins forms a permanent joint between old concrete and patches of new material. You simply apply the formula and pour the new patch. If you try breaking the bond, the concrete will fracture at right angles to the joint—tension compression and impact tests indicate that the bond is much stronger than fully hardened concrete, says Permagile Corp. of America, New York.



Two sets of straight wire, radial brushes mounted on a traveling head clean railroad car axles before magnetic particle inspection

Nylon brushes on this special machine clean eight engine cylinder bores simultaneously prior to assembly of pistons and rods



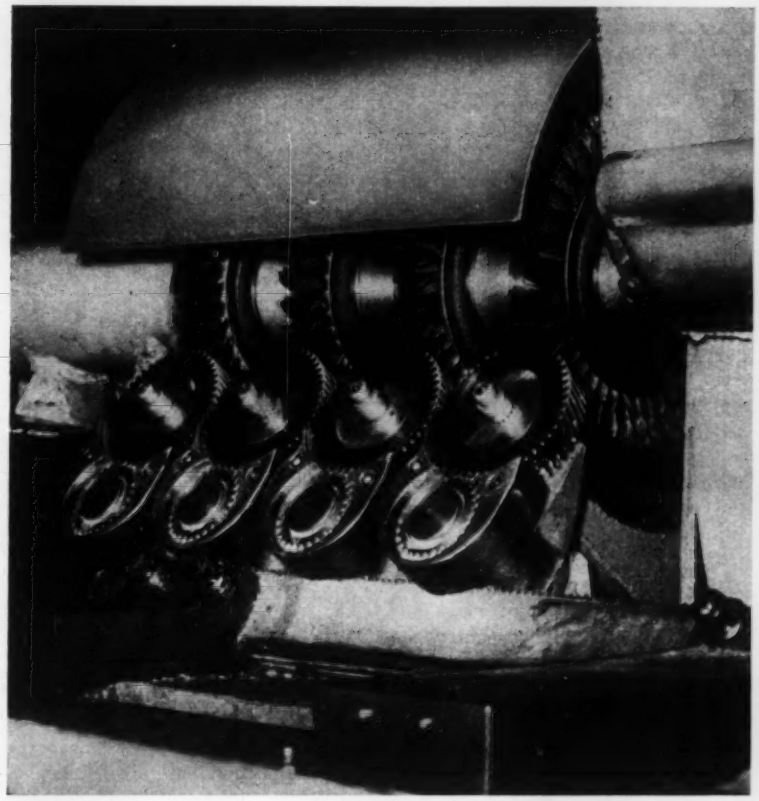
How To

By E. P. FISHER
Industrial Sales Engineer
Osborn Mfg. Co.
Cleveland

A POWER DRIVEN brush can be one of the most useful tools in your shop.

Progressive manufacturers are using them to produce radiuses (edge blending) at the intersection of surfaces, improve surfaces for greater wear resistance or to obtain more uniformly plated surfaces, remove burrs, clean, and roughen surfaces.

• **Work Three Ways**—Various effects are produced by three different actions: 1. The tips of the wires in wire filled brushes act like cutting tools in removing burrs and edge blending. 2. A wire filled brush also develops impact action caused by surface speed and length



Helical gears for automotive transmission are cleaned of heat scale, and teeth edges are blended by four, gang mounted, wire brushes

Select Power Brushes

They are available in metallic and nonmetallic materials for edge blending, deburring, cleaning, and surface conditioning. This article tells what they can do for you

of the wire. 3. Fine-wire brushes and nonmetallic brushes (such as treated tampico and Cord) act as an applicator or carrier when used with a grease base burring or buffing compound. Edges are blended and surfaces improved by the cutting action of the abrasive compound and brush.

• **Remove Edge Metal**—Brushes are selective in their action on an edge. They blend surface intersections by removing metal. Because the surfaces adjacent to the edge will not have a measurable amount of metal removed, the brushes cannot change tolerances of a machined part.

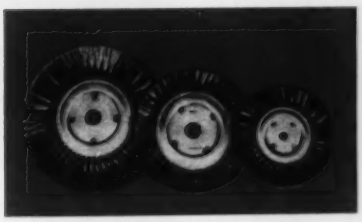
The development of radiuses on edges with brushes has other important advantages. Cord or treated tampico brushes will up part fatigue life 50 per cent or more.

Bendix Aviation Corp. discovered that principle in 1942. It was producing compensated cams for aircraft magnetos and finishing the surface to 1 microinch by hand with crocus cloth and oil. The part had an operating life of 300 hours.

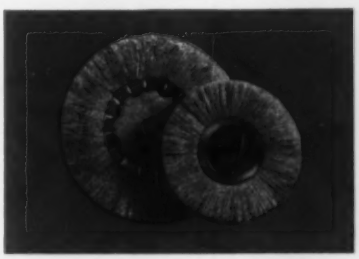
Parts were brush finished with treated tampico and burring compound as they came off the Gleason contour microgrinder with a 10 microinch finish. After 5 seconds of brushing, they had a 4 microinch finish, but tests showed no wear after 1000 hours. The results

Guide to Power Brushes

CRIMPED WIRE RADIAL BRUSHES are the largest and most common variety of the wheel type. They refine hard surfaces and have a slight tendency to roughen soft surfaces. They're used for removing chips, removing machining and grinding burrs, blending sharp surface junctures, removing soft materials (rust, paint, varnish), roughening, and surface conditioning



STRAIGHT WIRE RADIAL BRUSHES (knot type) have a narrow brushing face that gives high impact and cutting action. They will remove hard encrustments such as heat treating scale, sand from castings, scale from forgings, and heavy deposits of soft materials (rubber, for example). They're also useful in preparing metal for welding and removing burrs from hard metals



NONMETALLIC RADIAL BRUSHES are made with treated tampico, Cord, Tynex, nylon, and Korfill. The various grades and sizes can blend surface junctures for improved stress distribution and plating; remove small burrs; remove heat tint or light scale; remove rolling and slushing oil by wet cleaning; remove chips, buffing, and drawing compounds by dry cleaning

CUP BRUSHES can be made with crimped or straight wire. They are used to clean surfaces for painting or welding, cleaning welded parts, removing paint, rust, and surface scales. They can be made for light or heavy duty applications and are often used with portable tools

CENTERLESS GRINDER BRUSHES are a large radial type that fit standard centerless grinding machines. They can be filled with several sizes of wire, treated tampico, and Cord. They are often used following a centerless grinding operation to remove grinding burrs. Depending on their fill, they will do the same jobs as other types of brushes

END BRUSHES are designed with a shank that is integral with the cup. The fill material extends from the cup. The brushes are made in many styles for general and special uses. A typical application is cleaning in areas where there is limited clearance. They also can be used for cleaning holes or brushing areas around holes

prompted the Army and Navy Air Force to change specifications on the part.

• **Improve Surfaces**—Brushes will not remove metal from a flat surface or the surfaces adjoining an edge. They are often used after abrasive wheels on a centerless grinder or flat polishing when parts are to be plated. Abrasives leave minute particles of metal plus sharp points which cause wear and high surface densities.

Fine wire or treated tampico brushes used with a burring compound remove the metal particles and smooth the surface. More important is the stress relieving action and elimination of a surface condition that will cause wear.

The development of brushes for use on conventional centerless grinders has opened up new applications for these tools. Fine wire brushes used with conventional grinding coolants are removing feather grinding burrs and improving surface finish on such parts as control valves for automatic transmissions and piston pins. On these parts (they have a hardness of about Rockwell C58), the brushes improve the finish from 7 to 4 microinches.

In controlled tests, bearing rolls were brushed with a treated tampico brush on a Cincinnati centerless grinder. The brushed finish measured 4 microinches compared with 2 microinches by conventional methods. In testing the brushed bearings, investigators found there was a reduction of 25 to 50 per cent in the noise level, compared with standard bearings.

In all cases of finishing on cylindrical or flat parts, no dimensional change occurs. The part must be ground to size prior to brushing.

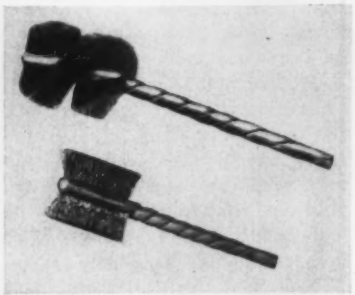
• **Removes Burrs** — A frequently asked question: What size burr can a brush remove? In practice, the size of the burr is not as important as its type.

If a sharp tool is used to make the cut, the burr may be large, but it will be fractured at the base and can be removed with the proper wire brush. If a dull tool is used to make the cut, or the speed is too fast, a burr is produced that has a heavy base where metal has been extruded beyond the edge of the intersecting surfaces. Those burrs are difficult to remove with brushing alone.

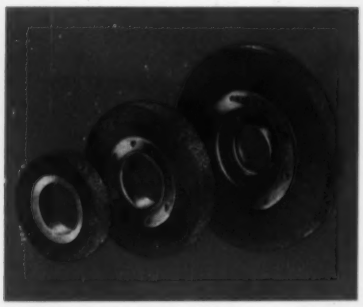
If the condition is not severe, short trim, densely filled brushes can be used. If it is severe, a prebrushing operation is required. A skiving tool is used to remove the large extrusion before brushing.

When the metal is ductile and tends to move easily, wire filled brushes will peen or roll the burr. Treated tampico brushes with a burring compound should be used. If the burrs are large, it is suggested that the major burr be removed with a short trim, densely filled wire brush, followed by the treated tampico brush to blend the edge and remove any peened metal.

• **Used for Cleaning**—Brushes are used for cleaning wet or dry. Brush-



SIDE ACTION BRUSHES are often used for cleaning internal threads and deburring drilled holes. The fill material extends on either side of the retaining member. Several filler materials, such as wire or nylon, may be used



RUBBER IMPREGNATED BRUSHES can be any of the seven types listed above. The distinguishing feature is that they are filled with an elastomer. They have greater cutting action, less flexibility, and retain face dimensions throughout their life

ing in a rinse or alkaline cleaner provides mechanical agitation of the surface which is required to break a film of dirt.

That's what happens when you wash your car.

The most common industrial application is in steel mills for scrubbing strip.

Cleaning dry is done primarily with wire brushes. Removal of rust before painting is common. Removing insulation from copper leads, or varnish from stators are other typical applications.

• **Roughening Surfaces** — Brushes are used in several industries to produce a surface that will promote adhesion. Typical is the roughening of rubber before bonding. Aluminum is brushed before painting.

In bonding metals, brushes are used to clean the surface and remove oxidation before bonding. An important feature is that the brushes roughen the surface without changing dimensions of the part. This type work usually uses the impact action developed by the brush to obtain the required effect.

Many new uses, such as decorative finishing, are being developed for nonferrous metals. The ability of a brush to produce a satin finish that will blend surface imperfections have enabled many in industry to reduce their finishing costs.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

How To Select Brushing Machines

IN DEVELOPING an edge blending, deburring, or other brushing method, several steps are recommended to assure proper machine design:

1. Test production parts to determine brush type, speed, feed rate or brush dwell time, and power requirements.

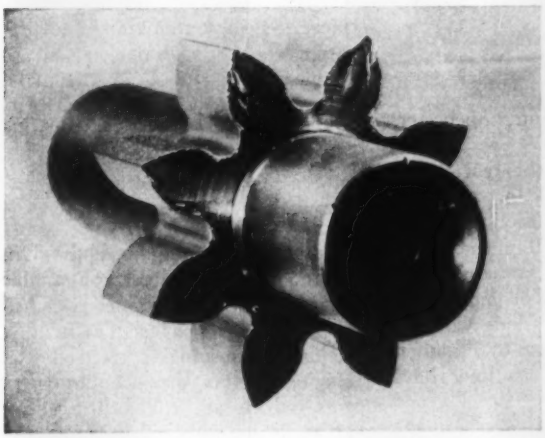
2. Select as large a brush as practical to obtain uniform action throughout its life, as well as the lowest cost per part.

3. Determine the proposed production rate. It will tell you the number of brushing stations or machines required.

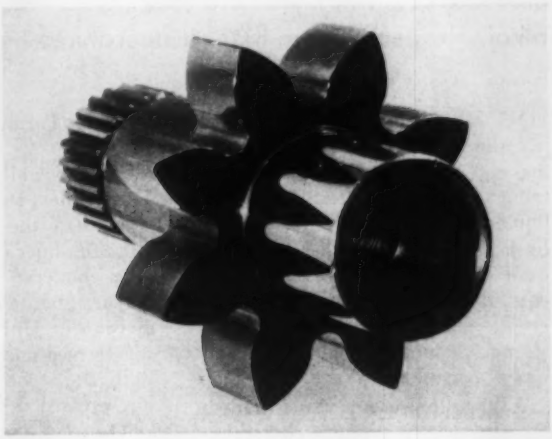
4. Determine the cost saving, improvement in quality, reduction in scrap. They will influence how much money can be allotted for mechanization of the method.

5. Determine if a standard machine will do the work. Several types are on the market.

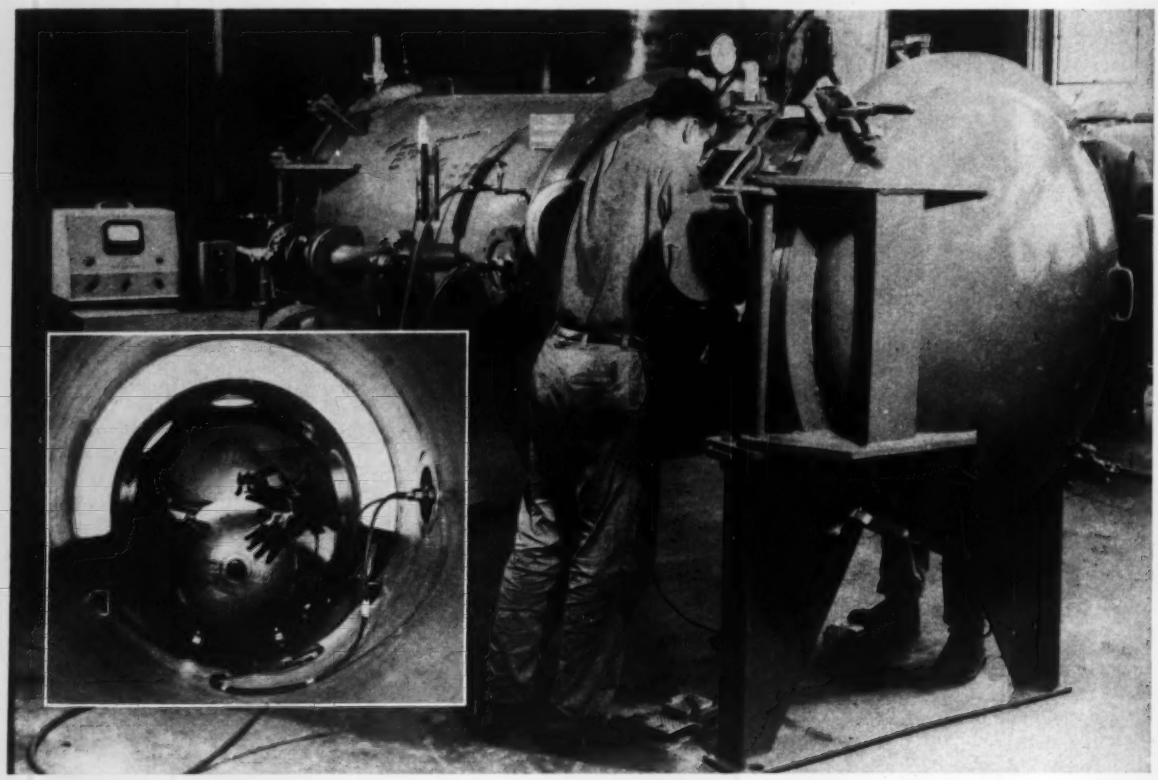
6. If it's necessary to design your own brushing machine, consult a brush manufacturer. He knows the factors that must be considered to get a well designed machine.



BEFORE brushing, this small component of a jet engine fuel pump looks like this



AFTER brushing with a power driven fiber brush and a compound, it looks like this



Welder reaches inside this inert atmosphere chamber with rubber gloves mounted to chamber walls. Inset: Tantalum liner is welded in atmosphere of inert gas

Tantalum Liner in Vessel Stops Corrosion Problems

Material used for internal parts of stainless steel reactor unit may be what you are looking for to resist acids and alkalis, especially at high temperatures

YOU MAY find that tantalum is just the material you need if you're making or using parts and containers that must resist corrosive liquids. The metal is not affected by acids or mild alkalies up to the limit of temperatures used at present. It has good antifouling properties, and can be purged with strong cleaning solutions without risk of corrosion.

A 30-gallon reactor vessel that can be used where product contamination must be avoided was made by Pfaudler Co., a division of Pfaudler Permutit Inc., Rochester, N. Y.

Exterior walls of the reactor are 430 stainless steel, 5/8 in. thick (for strength); the corrosion resistant tantalum liner is 0.030 in. thick. The liner material was produced by Haynes Stellite Co., Kokomo, Ind., a division of Union Carbide Corp. It was formed and welded by Pfaudler. Both the vessel and its liner have low expansion rates.

The agitator shaft used in the vessel is sheathed with tantalum, and the agitator is made entirely of tantalum; only tantalum surfaces can come in contact with the contents of the vessel.

• **Welded in Chamber**—Any metal 0.030 in. or thinner (including tantalum) is difficult to weld; sections of the liner were joined by welding inside a vacuum purge "dry box." The work area is first evacuated, then back filled with an inert gas. All welding is done in an atmosphere free of contamination to prevent porosities; such defects can appear in the work only as a result of errors in fabrication.

The welder and his helper handle the work inside the chamber with rubber gloves mounted to the chamber walls.

• **Improved Refining Methods**—Until recently, the largest obtainable swaged bar of tantalum weighed 20 to 25 lb. New vacuum melting facilities (consumable electrode) at Haynes Stellite produce larger ingots, which are rolled into sheets up to 24 in. wide, 60 in. long, and 0.030 in. thick, with improved welding properties.

Precision Parts Made Simply

Gun drill, used in drill press, holds close tolerances, gives excellent surface finish

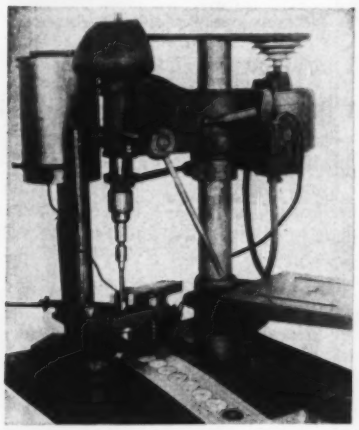
EFFECTIVE use of production machinery doesn't always require elaborate setups.

Example: After conventional drilling methods failed, a gun drill was mounted in a standard drill press at Bridgeport Special Tool Co., Bridgeport, Conn. The company turned out over a million precision parts that met all finish and tolerance requirements.

The idea was suggested by engineers of Eldorado Tool & Mfg. Corp., Milford, Conn., makers of gun drills.

• **Close Work**—The gun drill is 7 in. long, 0.3750 in. in diameter and has a solid carbide tip. The point is sharpened to make a cavity 0.187 in. deep (plus or minus 0.005 in.), with 45 degree sides.

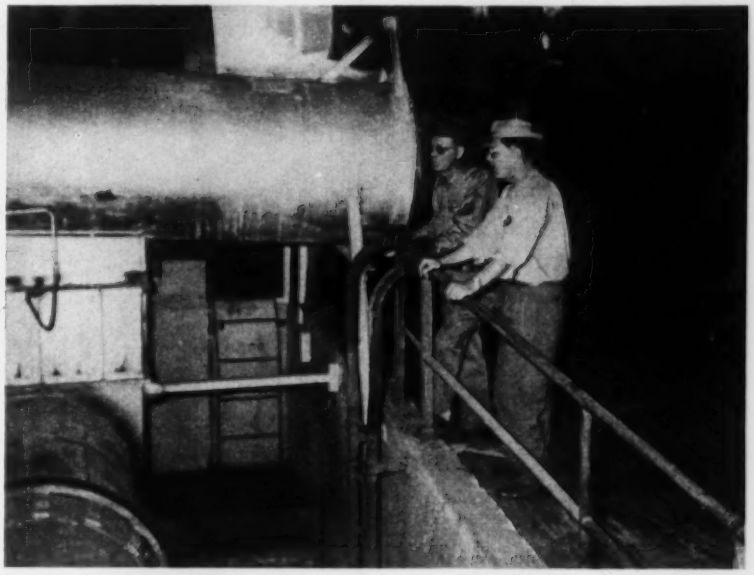
The cavity is machined in a disc of zinc plated, cold-rolled steel, 0.200 in. thick, with a 1.148 in. OD. The bottom is only 0.013 in. thick, and no deformation can show on the opposite side of the disc.



GUN DRILL
. . . does delicate machining job

A chute brings the discs under a bushing for drilling and removes them when the machining is finished. A stop bar aligns each disc under the bushing; a brass screw and nut regulate drill depth.

The press is operated by air at 125 psi. Spindle speed: 2200 rpm.



The afterburner (rear) attached to the chip dryer (below) eliminates a smoke problem for a firm in smog-ridden location

Chip Cleaning System Makes No Smoke

Afterburner solves air pollution problem for a west coast company. Chip preparation removes liquids simply, quickly, also provides for the removal of iron

A COMBINATION of rotary dryer, afterburner, crusher, and magnetic separator conquered a serious smoke problem for Federated Metals Div., American Smelting & Refining Co., Los Angeles.

It efficiently recovers aluminum, copper and brass alloys, and steel turnings for remelting and eliminates a source of smog. Two men operate the system.

• **Problem**—Water and cutting oil in the nonferrous metal chips present a serious fume problem when they are charged in a melting furnace. Wet turnings can be explosive if they are pushed beneath the melt surface in the smelter.

Scrap arrives at Federated Metals in all sizes. It is reduced by a crusher to allow more complete drying and to facilitate magnetic separation of iron.

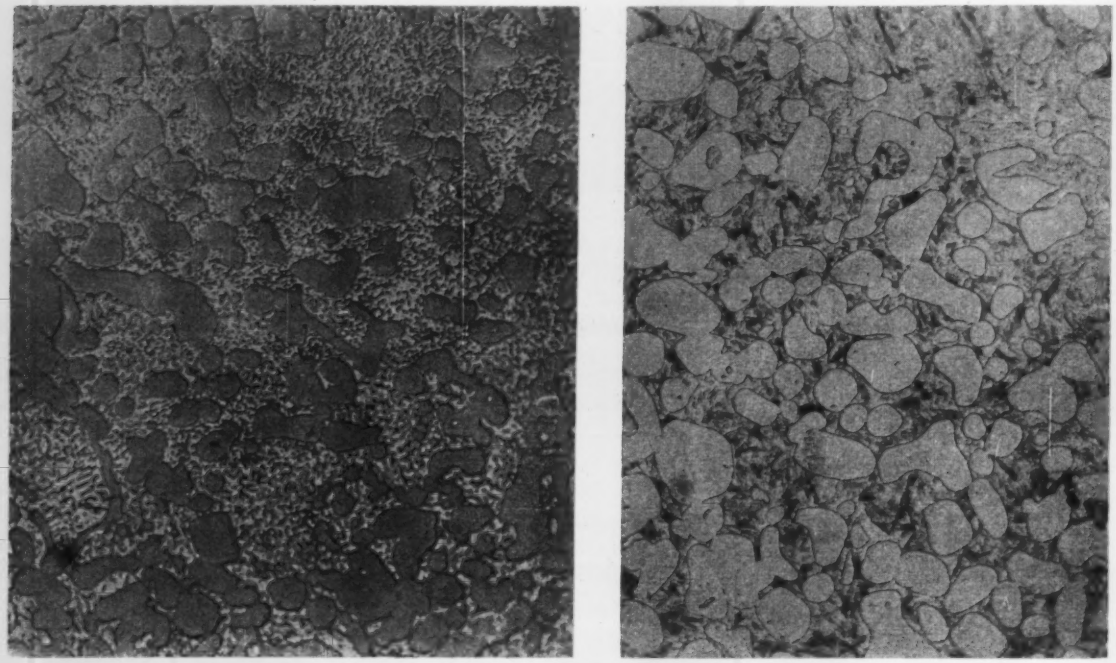
As it enters the dryer, the crushed material can contain up to 40 per cent water and oil (turnings are often stored or shipped in open containers). The dryer-burner uses standard fuel.

The afterburner governs capacity and speed. It completely burns oil exhaust from the turnings and eliminates the fumes. Exit temperature is about 350° F.

When the chips leave the dryer, they drop into a bucket elevator which is raised and discharged over a magnet. Iron clings to the magnet, allowing the aluminum to fall into another bucket.

• **Used As Model**—Federated Metals new secondary aluminum processing plant in Alton, Ill., has a newer system based on the Los Angeles model. It incorporates an improved afterburner, automatic temperature control, automatic ignition, and a combustion control system.

The dryer is 8½ ft in diameter and 35 ft long.



These photographs show the steel-bonded titanium carbide before (at left) and after hardening. Unhardened, the annealed titanium carbide grains and spheroidite are visible; after hardening, the spheroidite has been replaced by fine martensite. Both views are at X750; etch is nital

Carbide Can Be Machined, Then Hardened

Material also can be reannealed and reprocessed. It means you can correct errors in tool design or modify tools to make minor changes in the design of parts

HARDNESS makes tungsten carbide a great tooling material, but on some jobs it's a liability. The material is tough to machine.

A steel-bonded carbide (called Ferro-Tic) is now being used by some tooling experts; it can be machined conventionally in the annealed state (hardness is 38 to 42 Rc). After machining, it can be heat treated to an operating hardness of 69 to 71 Rc by oil quenching from 1750° F in a medium oil.

• **At Work**—The carbide is being marketed by Sintercast Corp. of America, Yonkers, N. Y. J. L. Ellis, vice president, tells STEEL the material has been used on a variety of metalworking jobs, including blanking, cold heading, slitting, forming, drawing, curling, and deep drawing. It has proved itself on many metals, including nickel alloys, stainless steel, mild and alloy steels, brasses, and phosphor bronze.

STEEL talked to the manager of a company that uses the carbide in dies that make expanded metal. On conventional alloys, he said, tool steel dies did the job, but one of the company's products is a fine expanded metal sheet (compares with a 50-mesh screen) that's made from commercially pure nickel. The carbide gives seven to eight times the life of conventional tools.

• **Benefits**—This material may pay off for you in several ways. For example, it can help you cut your tool inventory. By carrying a suitable stock of annealed blanks, you can fabricate special shapes when needed in a hurry.

Reduced inventory also is important to the tool and die maker. By stocking blanks within the size range of customer needs, he has an economical answer to his inventory problem.

• **Tool Change** — These carbides can be reannealed and reprocessed, so you can correct errors in die design, or modify tools to make minor changes in part design.

The ability to make changes is a major factor. A New York job stamper told STEEL he has a competitive advantage because he can make tools fast, give them a tryout, then make final modifications before going into full production.

• **Tool Re-Use**—Dies can be salvaged by reannealing and remachining to another useful size or shape.

Used tools also can be restocked and held until needed for another job.

US RUBBER STEEL MILL GRINDING WHEELS

PERFORMANCE DETERMINED IN ADVANCE ...for Cost-Minded Grinding Foremen

All steel mill wheels, hot or cold pressed, made by U. S. Rubber must measure up to the steel foreman's exacting requirements before delivery to the mill. "U. S." puts steel mill wheels to the test on rail-mounted "Ty-Sa-Man" automatic grinders in its own plant. The grinding wheel is tested under the same conditions and pressures encountered on the job in the steel mill.

The "Ty-Sa-Man" determines, for example:

1. Metal removable per hour.
2. Total metal wheel will remove.
3. Wheel life.
4. Cost per pound of metal removed.

These facts are determined for the cost-conscious grinding wheel superintendent or foreman *before* the wheel goes into service. Guesswork is out—certainty is in.

The U. S. Rubber salesman who serves the grinding wheel industry is a specialist selling grinding wheels only. He has back of him the wealth of experience accumulated by U. S. Rubber's ninety-four years of filling the grinding wheel needs of industry.

Your U. S. Rubber salesman will stop in to invite you to make full use of the cost savings obtainable through the Ty-Sa-Man machine or write to address below.

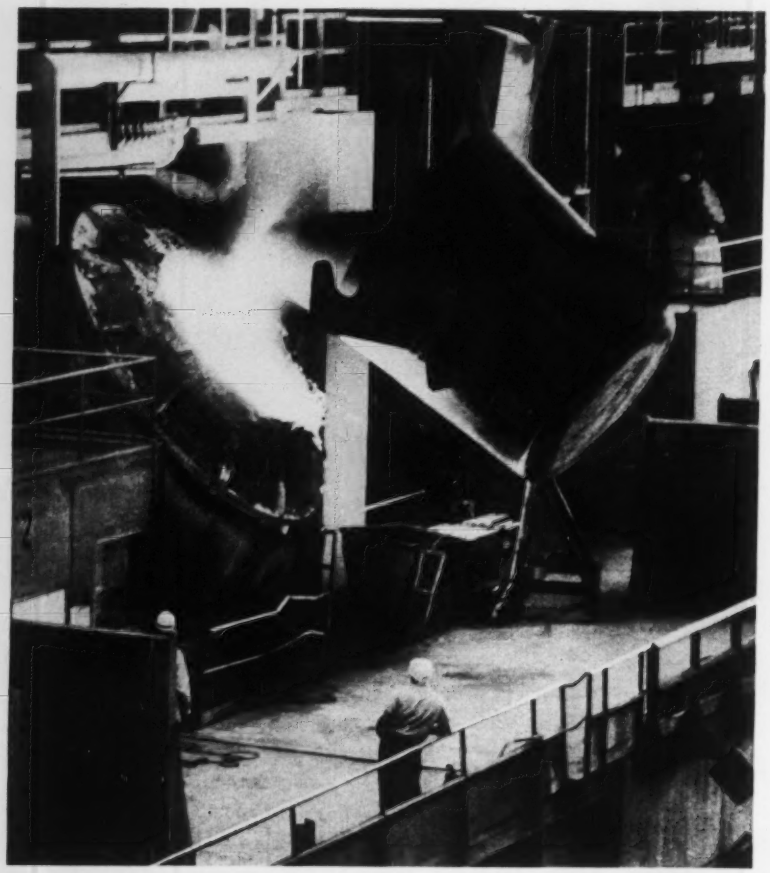
US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.



Tilted forward in its charging position, one of the Kaiser basic oxygen furnaces receives molten iron. It will be followed by scrap steel, lime, and oxygen

Predicts 45 Million Tons Of Oxygen Steel by 1965

Kaiser Steel Corp. has just added 1.5 million tons of capacity. Kaiser Engineers sees the oxygen process accounting for 25 per cent of capacity in six years

BY 1965, L-D Process (oxygen converter) installations in the U. S. will account for 45 million ingot tons, a projected 25 per cent of U. S. steelmaking capacity, predicts Kaiser Engineers Div. of Henry J. Kaiser Co.

Almost 1.5 million tons of capacity was added a week ago when Kaiser Steel Corp., Fontana, Calif., poured the first official heat from its three, new, basic oxygen furnaces.

(The L-D Process of basic oxygen steelmaking is named after the two Austrian towns where it was developed—Linz and Donawitz. Kaiser Engineers holds exclusive rights for licensing the process in the U. S.)

• **Worldwide Growth Seen**—Elsewhere in the world, an even more rapid increase in capacity is forecast. With oxygen steelmaking plants now operating in Canada, Austria, West Germany, the Netherlands, Japan, India, Brazil, and the USSR, world capacity of oxygen steel, including plants under construction, has reached nearly 11 million ingot tons.

By 1965, that figure will be 120 million, says Kaiser Engineers. That means that oxygen steelmaking will account for 35 per cent of the steelmaking capacity of all the other countries in the world.

• **U. S. Growth Startling**—Oxygen steelmaking has registered a fantastic growth in this country in seven years. When Acme Steel Co., Chicago, starts up its two converters this year, U. S. capacity will exceed 4 million tons—almost one-third of our electric steelmaking capacity.

At Trenton, Mich., McLouth Steel Corp. is operating five oxygen converters with a capacity of about 1.4 million tons a year. At Aliquippa, Pa., Jones & Laughlin Steel Corp. has two vessels that can turn out 756,000 tons a year. Acme Steel Co.'s two converters will have a capacity of 451,760 tons a year.

With the addition of 1,440,000 tons of oxygen steelmaking capacity, Kaiser Steel Corp. has doubled its total ingot capacity. (The plant has nine open hearths that can produce 1,493,000 ingot tons.) With a total capacity of 2,933,000 ingot tons, Kaiser has become the largest steel mill in the West.

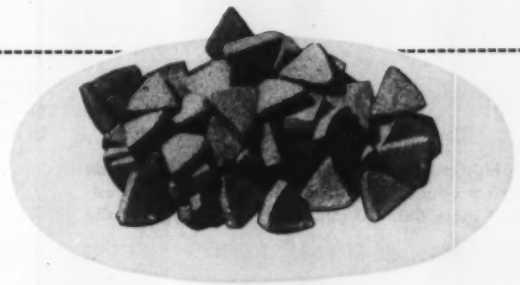
• **Completes Expansion**—The opening of the new steelmaking plant completes all the major facilities in Kaiser's $214 million expansion which has been going on for two and a half years.

In addition to the steel plant, the

Announcing...

Improved TUMBLEX "T" barrel-finishing abrasive

...harder...lasts longer ...saves more



Greater hardness now adds greater durability to Norton TUMBLEX "T" abrasive.

That's why you can count on this revolutionary barrel-finishing abrasive for greater staying power than ever before — and longer lasting ability to deliver its famous "Touch of Gold" advantages like the following:

Available in six sizes, the uniform triangular shape of TUMBLEX "T" abrasive prevents wedging in recesses . . . Made of bonded ALUNDUM* abrasive, it cuts fast, without cutting compounds . . . By providing maximum surface contact it shortens tumbling time cycles and increases barrel payloads . . . It wears evenly, and when reduced in size it can be used for parts requiring a smaller abrasive.

Send your samples of parts — large or small, simple or intricate — to our Sample Processing Department. We'll barrel finish with the most suitable TUMBLEX type abrasive for your work — "A" (random shaped ALUNDUM aluminum oxide), "T" (bonded ALUNDUM abrasive triangles), "S" (bonded ALUNDUM abrasive spheres), or "N" (natural stone) — and tell you exactly what's needed to improve your product quality and cut your finishing costs. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

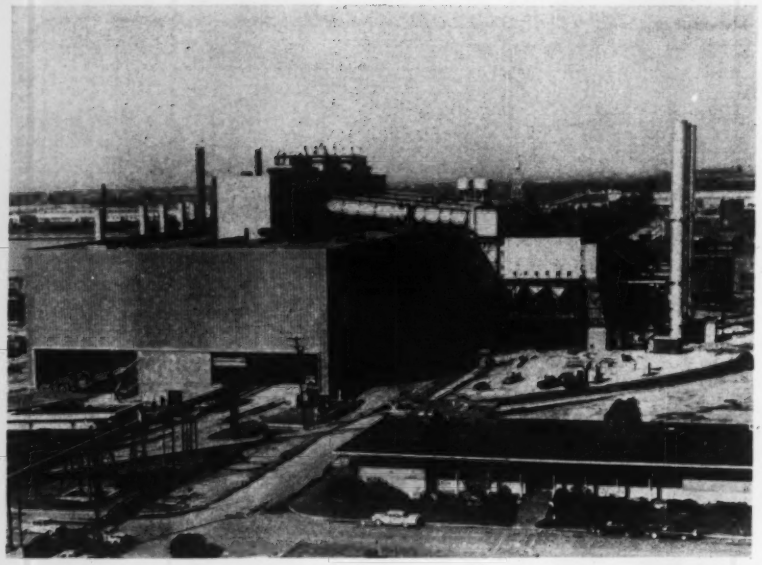
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

G-359

NORTON ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

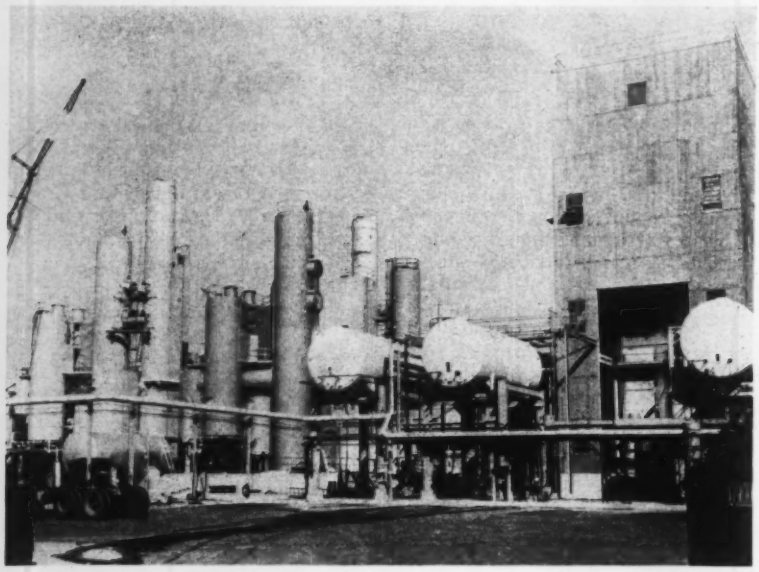


This is the basic oxygen steel plant which houses the new furnaces. The structure to the right of the main building, marked by the three stacks, is the electrostatic precipitator, which cost nearly $5 million

expansion has included a fourth blast furnace, a new slabbing mill, a new hot-strip mill, 90 more coke ovens, extensive additions to the tin plate mill, new facilities to produce wider steel plates, and improvements at company owned mines at Eagle Mountain, Calif., Sunnyside, Utah, and Raton, N. Mex.

Linde Co., a division of Union Carbide Corp., has more than tripled its oxygen producing capacity at its Fontana plant to meet Kaiser Steel's need. Linde Co. facilities adjacent to the steel plant supply more than 10 million cu ft of oxygen daily to operate Kaiser's oxygen steelmaking vessels and other operations.

To meet the increased demand for high purity oxygen in the Kaiser plant, Linde Co. has more than tripled its oxygen producing capacity. The Linde plant is adjacent to Kaiser Steel, and supplies it more than 10 million cu ft of oxygen daily



• **How Process Works**—The oxygen furnaces are melon-shaped crucibles resting on trunnions. They are driven by powerful electric motors which tilt the furnaces from side to side. Each vessel is 26 ft high, 18 ft in diameter, and weighs 475 tons empty.

Molten iron, steel scrap, and lime are charged into the furnace. A jet of high purity oxygen directed over the surface of the metal results in an immediate reaction which builds the temperature up to 3000° F and refines the charge. Refining time is less than 30 minutes.

Oxygen steelmaking begins with the charging of hot metal into the open mouth of the furnace as it is tilted forward. This is followed by scrap steel. The furnace is returned to an upright position and lime is charged automatically through a chute.

A water-cooled lance is then lowered into the mouth of the furnace to a position several feet above the molten bath, and the jet of oxygen is blown on the surface.

Near the end of the refining period, the furnace is tilted, the temperature is measured, and test samples are taken. The furnace is then rotated to the pouring position and the molten steel is tapped into a ladle through the tapping hole near the top of the furnace. The entire cycle, including charging, is about 1 hour.

• **No Smog Problem**—An integral part of the new steelmaking facility is what Kaiser describes as the world's largest precipitator. It is designed to control the smoke and fumes generated in the oxygen furnace process. It cost nearly $5 million.

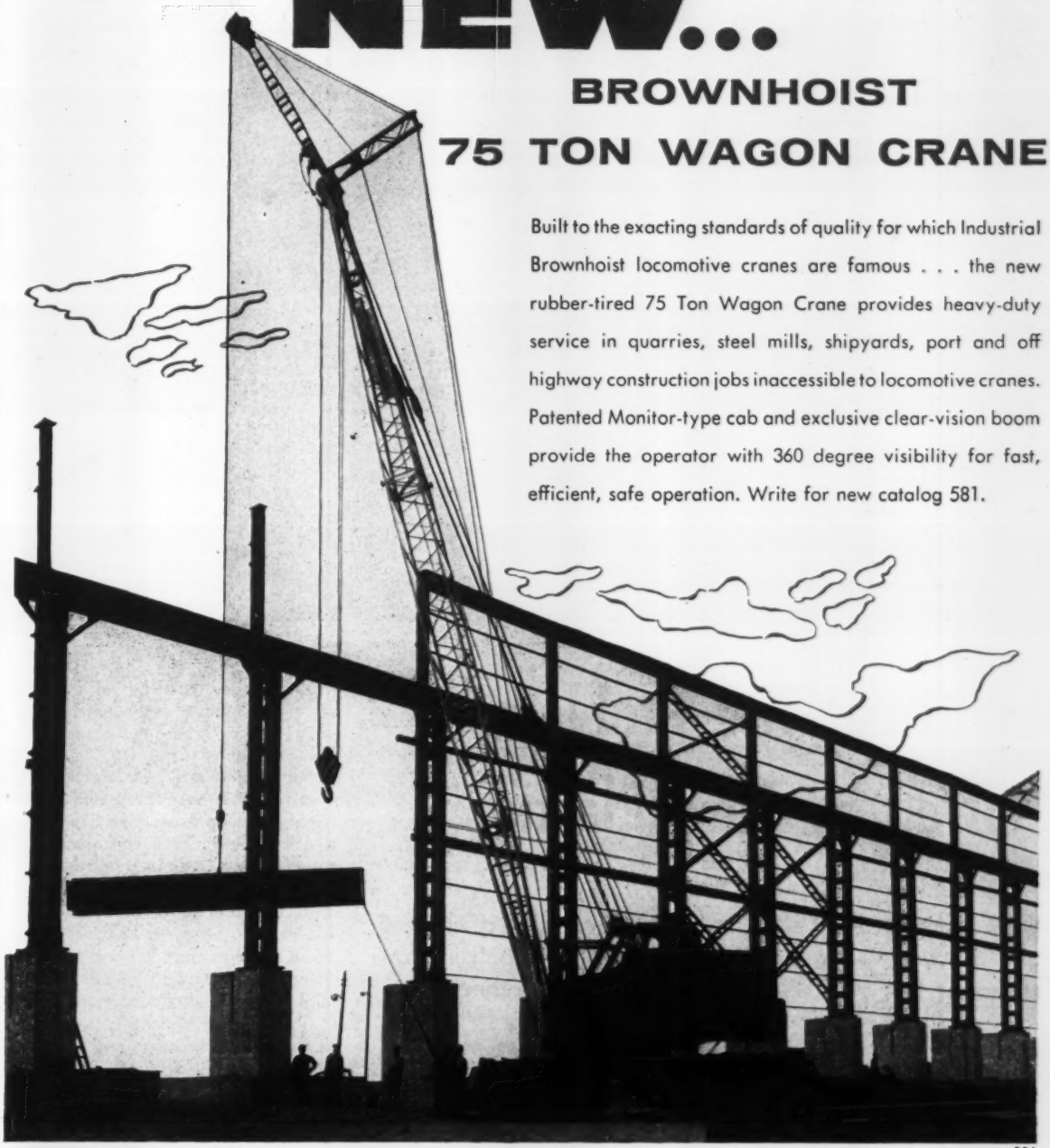
Steel produced in the new oxygen furnaces will augment the steel Kaiser produces in its nine open hearths. It will be fed into the plant's ten rolling mills which produce a wide range of semifinished and finished steel products.

NEW...

BROWNHOIST

75 TON WAGON CRANE

Built to the exacting standards of quality for which Industrial Brownhoist locomotive cranes are famous . . . the new rubber-tired 75 Ton Wagon Crane provides heavy-duty service in quarries, steel mills, shipyards, port and off highway construction jobs inaccessible to locomotive cranes. Patented Monitor-type cab and exclusive clear-vision boom provide the operator with 360 degree visibility for fast, efficient, safe operation. Write for new catalog 581.



206

BROWNHOIST

CLAMSHELL BUCKET

250 TON WRECKING CRANE

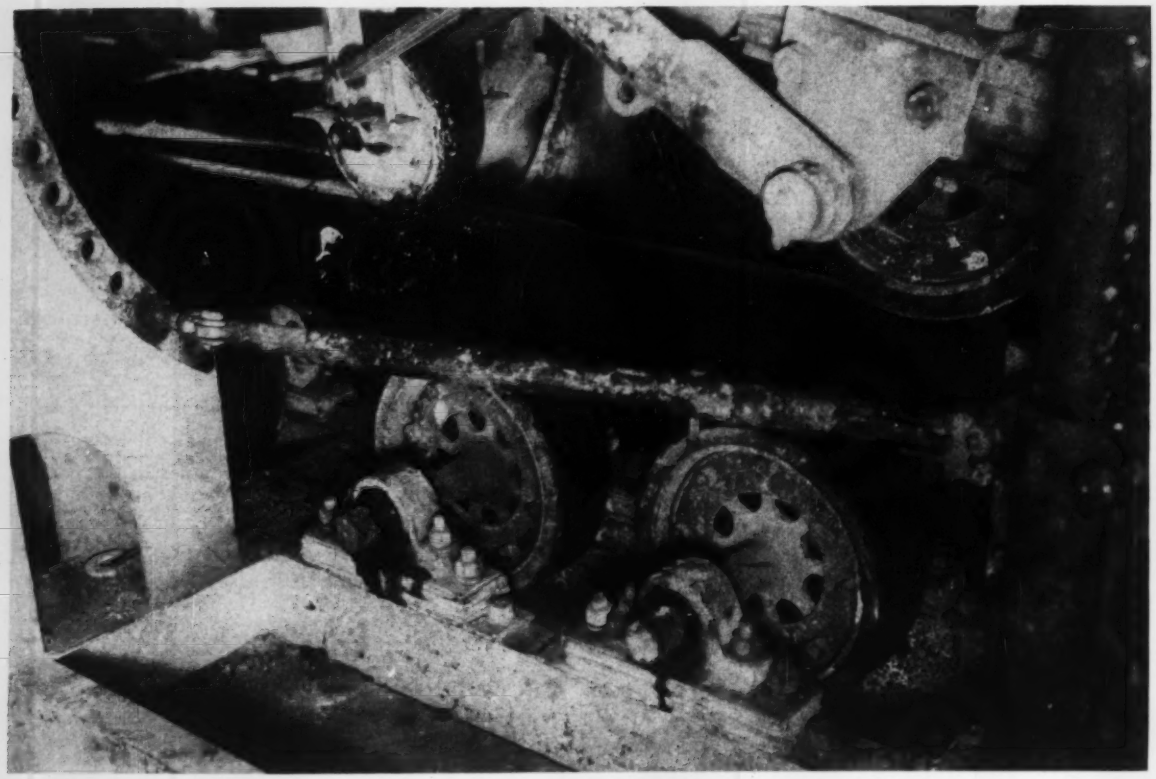
COAL-ORE BRIDGE

CAR DUMPER

LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: Cleveland, Philadelphia, Chicago, San Francisco, Montreal.

• AGENCIES: Detroit, Birmingham, Houston



Disogrin tires on drive wheels resist bite of pipe couplings. Result: Longer wear

Industrial Tire Problem Solved by New Plastic

Steel wheels scarred surfaces, rubber tires peeled, chipped, and grooved under loads. Solution: A new polyurethane elastomer that gets 12 times more wear than rubber

IF YOU are not getting satisfactory wear from solid rubber tires, consider this new plastic. H. C. Price Co., Harvey, La., an applicator of corrosion protective pipe coatings, eliminated an acute downtime situation with it.

• **Case History** — The difficulty: Failure of wheels on a traction drive machine. Its function is to drive pipe through a coating nozzle which applies a corrosion protective compound. Eight 4 x 14 in. wheels sustain loads of 1500 to 5000 psi, depending upon the size and diameter of pipe. Linear speeds vary from 50 ft per minute (small pipe) to 10 ft per minute (large pipe).

• **Problem** — The original steel wheels were durable but scarred the primer coat and pipe surfaces when loads were extreme and operating speeds low. Rubber tires were tried, but they presented even more serious problems. Heavy loads would peel the tire off the hub, meaning at least 1 hour in replacement time. Lost production time plus direct maintenance expenses amounted to many hundreds of dollars per wheel. Multiply the figure by an average of eight wheels per month and wheel turnover becomes costly.

• **Solution**—For a year and a half, a variety of rubber compounds were tried without success. Early in 1957, a new polyurethane elastomer was tested. The material, called Disogrin, was introduced by Disogrin Industries Inc., Mt. Vernon, N. Y. It is said to be up to 12 times more wear resistant than rubber, has low compression under loads, and is highly chip and groove resistant.

Two Disogrin wheels were installed where pressure and abrasive action were the greatest. After 90 days of operation, they showed no effects from chipping, tearing, grooving, or peeling off the hubs. In three months, the wheels had been reduced only $\frac{3}{4}$ in. in diameter. In one month, rubber lost 1 to $1\frac{1}{4}$ in. in diameter. Most important to the Price company, replacement was not necessary.

After the test, Price equipped the rest of the wheels on the drive machine with Disogrin wheels. After a year of operation, there were no chipping, peeling, or grooving problems.

LEDLOY*

Free Machining Steels for Forgings

LEDLOY

METALWORKING SHOPS FIND LEDLOY* STEEL FORGINGS SAVE TIME . . . TOOLS . . . FINISHED PART COSTS!

Metalworking shops in ever increasing number are specifying *Ledloy* steels in forgings. The trend started when it was found that forged parts made with *Ledloy* steels resulted in savings far surpassing the original higher cost of the forging. *Ledloy* is widely known as Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Forgings made from *Ledloy* steels can be heat treated and forged in exactly the same manner as similar non-leaded grades of open hearth steels, while machinability is increased up to 50% in many applications.

Thus, regardless of grade of steel in use currently for your product, if machining is an important part of the fabricating process, the experience of hundreds of metalworking plants has proven that a change to a similar *Ledloy* grade can definitely cut total machining cost in many cases.

cost-cutting factors:

Increased machinability, higher speeds and feeds, easier tolerance control, reduced tool wear, less down-time, greater production per tool change and fewer finishing operations.

Although it is well known that *Ledloy* Grade A can be machined 45% faster than B1113 and *Ledloy* Grade B 100% faster than B1112, it is not as widely realized that forgings made of *Ledloy* steels can show similar startling results. If present equipment is not being run at highest potential speeds, considerable savings can result using *Ledloy* grades and taking advantage of their much greater machining rate. Surface speeds of 325 feet per min. are common and much higher speeds are possible—up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling when using Grade A *Ledloy* steel.

If current operations wear tools excessively, necessitating frequent tool changes, or if tooling cost is relatively high, *Ledloy* steels can effect significant savings. Because the Inland process of adding lead to steel lowers the steel's frictional component, less heat is generated during machining. *Ledloy* steel's shorter-length chips quickly fall clear of the tools, and tool-edge build-up is minimized. The end result, clearly discernable, is far greater production, less down-time for tool changes and a welcome reduction in total machining cost. *Ledloy* steel's lubricating and better-chip-forming qualities make it the fastest machining steel in the world. The superior surface finish obtainable with leaded steels can often result in the elimination of one or more subsequent finishing operations.

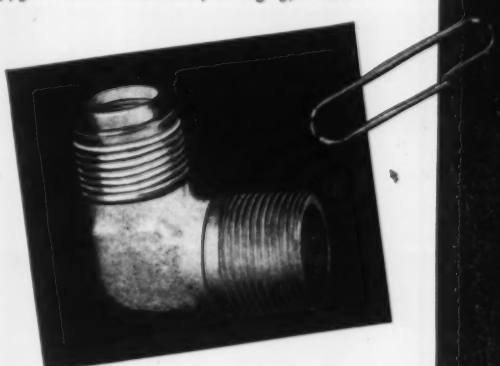
characteristics:

Inland regularly produces *Ledloy* free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of chemical composition, *the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel.* All the important qualities of open hearth steels such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness, are fully retained. *The only thing changed is the machining characteristic which is vastly improved.*

availabilities:

Inland *Ledloy* free-machining steels are available in a wide range of standard carbon and alloy grades in bar form or plates. In forgings, the increase in machinability is every bit as good as that obtained in bar stock steel and finish is superior.

If your product requires machining, it will pay you to investigate the potential savings offered by Inland *Ledloy*—the original leaded steels. Ask your Cold Drawer or Steel Service Center about Inland leaded steels, today. They are offered as *Ledloy* or under other brand names. For the very informative booklet, "Properties of Inland Ledloy Steels," write to Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois.

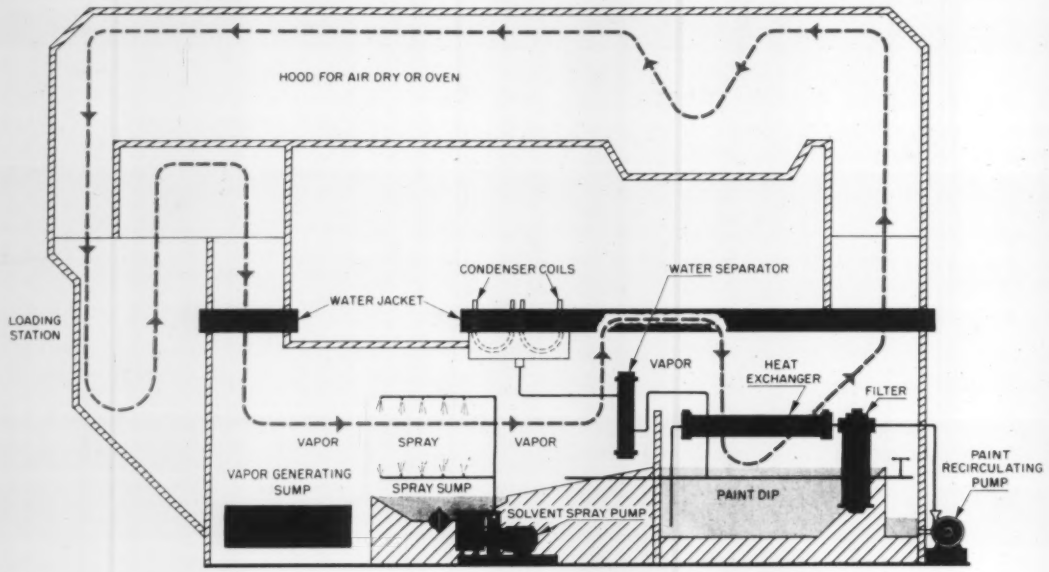


A switch to Ledloy Grade A in these forged fittings permitted a 27% increase in machinability.

INLAND STEEL INLAND **LEDLOY STEELS**

the world's most machinable

*Reg. Trade Mark



Detrex Tri-Cote system utilizing a crossrod conveyor. Cleaning cycle is vapor-spray-vapor. Then work is transferred through a vapor temperature holding zone and dipped

Cleaning and Painting in One Unit Can Cut Your Costs, Save Space

With these new compact machines, you put in a dirty part and remove one that is clean, painted, dry, and ready to ship. They handle lightly or heavily soiled workpieces

IF YOU clean parts in one unit and spray paint them elsewhere, you can cut your operating costs in half with a new process (Tri-Cote) that combines the operations in one compact machine.

The maker, Detrex Chemical Industries Inc., Detroit, says the process also shows important savings in initial investment and maintenance costs over methods that use separate facilities. (See chart of comparative costs at right.)

In most instances, the machine will occupy about the same floor space a suitable degreaser would take, says T. J. Kearney, chief engineer at Detrex.

• **Uses New Solvent**—The process was made possible by the development of a complete range of paints that use stabilized trichlorethylene as a thinner. They can be applied by dipping or flow coating.

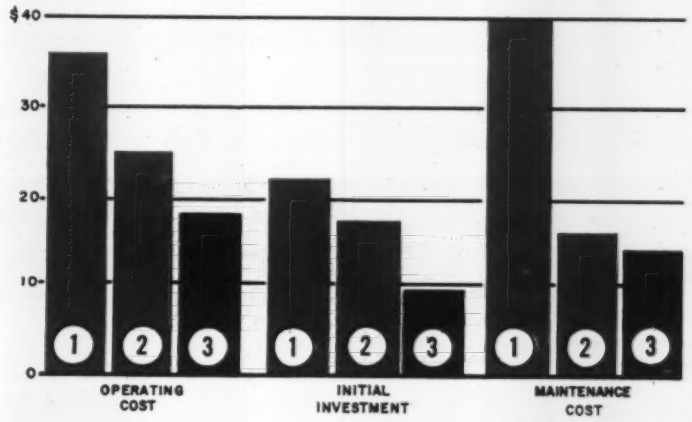
Mr. Kearney anticipates that many types of alkyd, acrylic, and epoxy resin base paints can be compounded into trichlorethylene-thinned paints. They will open up a new concept in the metal finishing field with these advantages:

1. Use of a nonflammable thinner.
2. Elimination of overspray.
3. Reduction in floor space needed.
4. Improved plant layout due to elimination of fire hazard.
5. Savings in labor and utility costs.
6. Reduced initial investment.
7. No drip area required.
8. Uniform paint film of high quality.

Another important feature: The saving when a two-coat finish is required. Many times, the finish coat can be applied in any conventional manner and both coats baked at one time.

Costs of Cleaning and Painting By Three Different Methods

1. Alkali spray clean, oven dry, hand spray paint, oven dry.
2. Alkali spray clean, oven dry, paint dip, oven dry.
3. Detrex Tri-Cote process: Vapor-spray degrease, flow coat with trichlorethylene-thinned paint.



• **Several Cycles Possible**—Cleaning can be done by vapor or by any basic degreasing cycle. Possible combinations: Vapor-spray-vapor; boil-rinse-vapor; vapor-rinse-vapor.

Trichlorethylene-thinned paints can be applied by flow coating at 188 to 210° F, or by dipping at 188 to 190° F.

Leveling and drying of the paint film are done in a vapor zone. Excess paint returns to the paint sump for re-use. Evaporation of the thinner is essentially completed within the machine. With air-drying paints, parts are ready for packaging or processing almost immediately.

• **Process Dictates Handling**—Detrex has two basic cleaning and painting unit designs. When paint is to be applied by flow coating, a monorail conveyor is used to carry parts through the machine.

The monorail unit has a carefully separated vapor-spray-vapor cleaning cycle, a vapor heated temperature holding zone, and flow coating and leveling zones. A compact return-type monorail unit provides maximum solvent economy and requires minimum floor space.

For applying paints by dipping, a crossrod conveyorized unit is suggested. (See drawing no Page 94.) Parts are cleaned in a vapor-spray-vapor cycle, carried through a vapor temperature holding zone, then dipped.

• **Substitutions Possible** — Alternate cleaning cycles can be selected for either unit, depending on the contour of the work and the type of soil to be removed.

Cleaning by vapor alone is adequate for lightly soiled parts. A warm, pressurized trichlorethylene spray will flush off insoluble as well as soluble soils. A spray is also useful where thin sheet stock is to be cleaned and the part is so light that condensation of vapor does not produce enough liquid to flush off all oil and grease.

Regardless of the cleaning cycle or painting method chosen, the unique features of the process allow a manufacturer to put a dirty part into the machine, and to remove a processed part that is clean, painted, dry, and ready to ship.

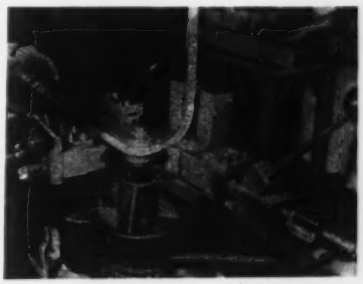
Sharp Bends Up Use Of Titanium Tubing

EVEN where sharp bends are required, you can use titanium tubing now. New bending tools and methods have been developed by Kreisler Industrial Corp., Paterson, N. J., a division of Jacques Kreisler Mfg. Corp. It made its tests with Grade A-40, soft annealed, commercially pure titanium tubing, produced by Superior Tube Co., Norristown, Pa.

The metal is expected to find greater design use where space saving, light weight, and high strength are requirements. Example: The aircraft and missile industries.

• **Old Methods Improved**—With a modification of standard methods, the tubing can be bent on a radius as small as its own outside diameter.

Tubing is held in position under pressure and supported by special moving clamps and dies as it is bent around a mandrel. Wrinkling is minimized, even on sharp bends.



ROTATING MANDREL
. . . makes sharper, smoother bends

• **Precautions**—If you plan to do similar work, it is suggested that you:

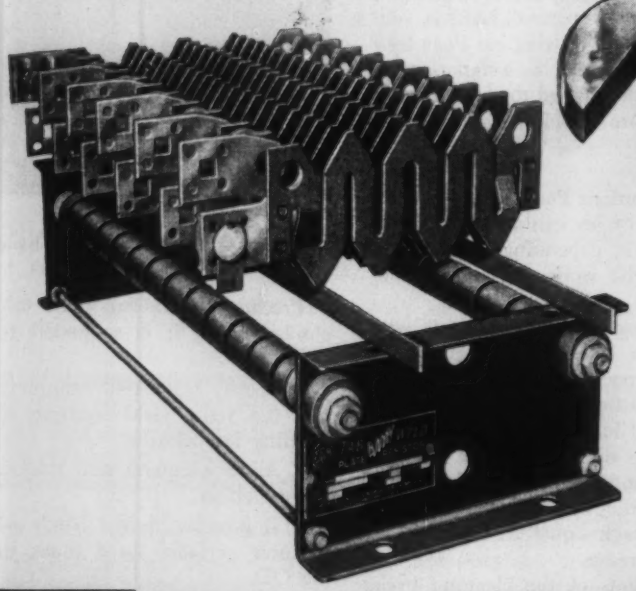
1. Specify soft, A-40 titanium; it has the right yield strength and ductility for bending.
2. Allow adequate wall thickness for stretching.
3. If possible, design bends with radiuses at least three times tubing OD.
4. Make all bends on the same radius, if possible, to reduce tooling needs and cut production costs.
5. Space bends far enough apart to keep work hardening at one bend from interfering with another.

HANDS OFF!

EC&M TAB-WELD RESISTORS REQUIRE *MINIMUM* MAINTENANCE

Only EC&M TAB-WELD PLATE RESISTORS are both bolted and welded for constant current path Unlike other resistors, they do not require periodic tightening of clamping nuts to compensate for loss of pressure caused by alternate heating and cooling. Grids are offset and mating ends are spot welded. Tap-plates are also welded into place at close intervals along the grid assembly.

This exclusive EC&M construction offers 4 big advantages on heavy duty motor applications: (1) stabilized ohmic value (2) no burning at grid-eyes or at tap-plates (3) easy tap-shifting for best motor performance and (4) long life with virtually no maintenance!



FEATURES THAT REALLY COUNT!

- Nonbreakable
- Corrosion-resistant alloy steel
- Negligible resistance change between cold and maximum working temperatures
- Offset resistor ends spot-welded
- No burning at grid-eyes
- No burning at taps
- Small adjustments in resistance value easily made
- Insulating spacers remain dimensionally stable
- No periodic tightening of clamping nuts
- All standard sections same size
- Double insulation to ground
- Fast connection to any tap-plate

Write for illustrated Bulletin 6715
Complete data on EC&M TAB-WELD RESISTORS

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

7404-R

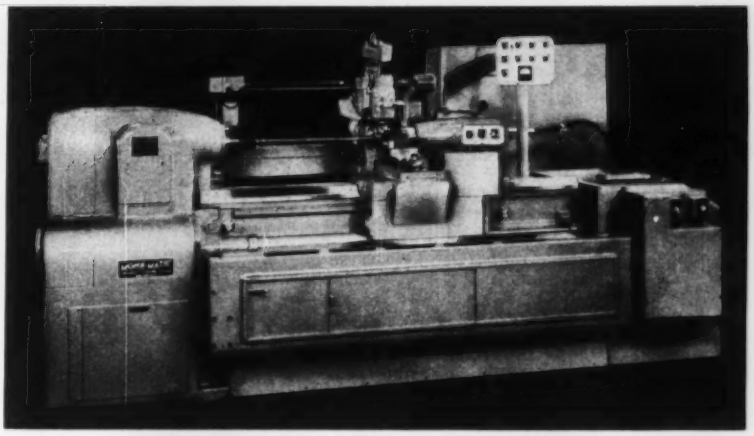
Production Lathe Contours Long, Slender Workpieces

YOU CAN turn long, slender workpieces (especially those which are tubular) without springing on the Model 21 Mona-Matic Lathe.

When contours must be turned on the outside diameter, conventional steady or follow rests cannot be used, so the lathe has antifriction follow rest rollers mounted above and behind the workpiece. Each roller is moved in and out by its own hydraulic cylinder which is controlled by an Air-Gage Tracer.

Another follow roller, spring loaded, is located adjacent to and following the tool.

Turning is done under Air-Gage Tracer control. The tracer slide is set at a 90 degree angle to the work, and the template (a master workpiece) is traced by three tracer heads.



The front head controls the cutting tool; the other two control the follow rollers.

The machine can be provided with equipment to handle two master workpieces, one for rough turn and one for finish turn. Template carriers and tools index hydraulically for the two operations.

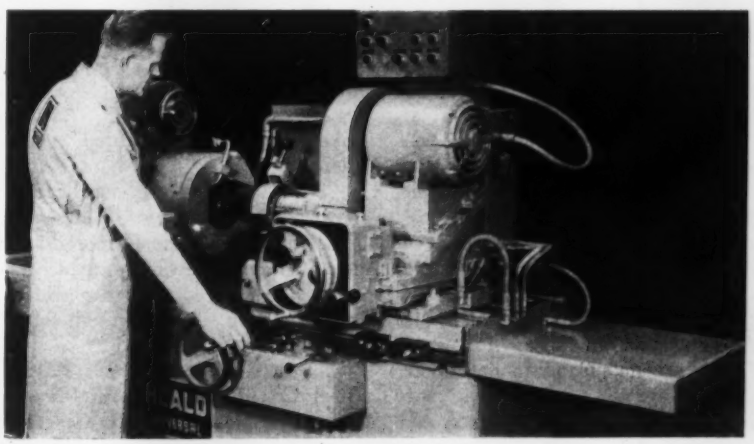
For more information, *write* Monarch Machine Tool Co., Sidney, Ohio.

Universal Grinder Has Oil-Supported Table

HERE is a universal grinder for bore, outer diameter, and rotary surface grinding that can hold roundness tolerances within 50 millionths of an inch.

The standard machine package is priced under $12,000. It is sold as a basic machine with cross slide as standard, plus building block attachments for special operations.

A new Heald development is featured on the grinder: Hydrastatic antifriction ways. The table and cross slide are supported on pockets of oil at 75 psi without



metal to metal contact. Oil pressure increases in the pockets that are under load to maintain level of the machine relative to the base.

The standard machine has 20 in. of table travel. Workhead cross slide travel is 11½ in., and the workhead swivels 90 degrees. Table speeds of 0 to 15 fpm for grinding and 35 fpm in rapid traverse are possible.

For more information, *write* Heald Machine Co., 5 New Bond St., Worcester 6, Mass.

TV Adjusts to Light

CHANGING light levels do not affect the output signal strength of two automatic, closed circuit television cameras just introduced.

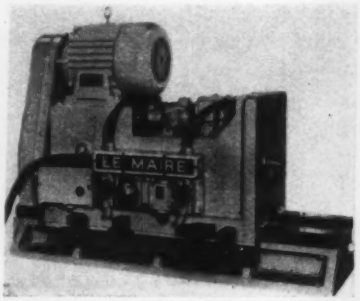
Designated the TE-6-B and TG-2-B, the cameras utilize a regulated target voltage to maintain a uniform output level over light changes greater than 150 to 1.

Accessories make possible remote aiming of the cameras at distances up to 1 mile. For more information, *write* Closed-Circuit Television, General Electric Co., Electronics Park, Syracuse, N. Y.

Hydraulic Units Power Many Machine Operations

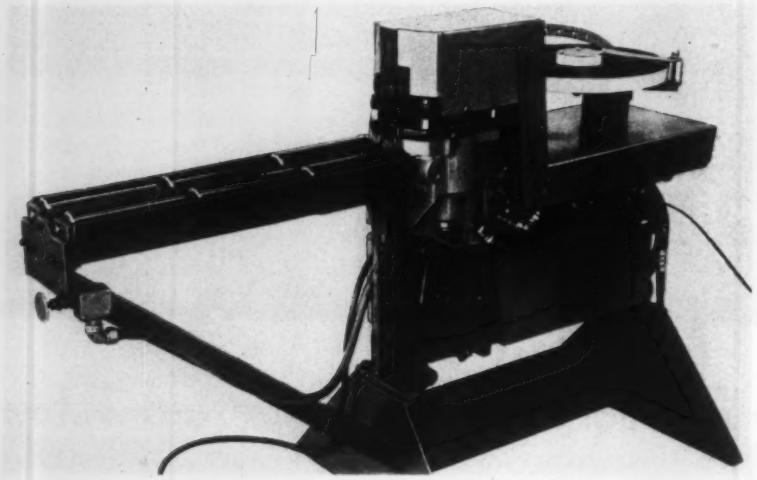
BUILDING-BLOCK construction is available for economical automation of machine tools. The Le Maire SU-5 way hydraulic units can be rearranged at will for a variety of applications.

They can be mounted horizontally or vertically for drilling, reaming, milling, boring, chamfering, and similar machining operations.



The units are self-contained, with cross-keyed construction that permits ready removal and remounting. Other features: Variable delivery pump, automatic lubrication, and spindle speed changes.

For more information, *write* Le Maire Machine Tool Co., 2657 S. Telegraph Rd., Dearborn, Mich.



Power Strapper Has Unlimited Range

WHEN you have a lot of packages of different types and sizes that have to be strapped, you can do the job fast with a power-driven machine called the Model F4.

Electrical and pneumatic power do the work. Each strap is applied with the same tension, which can be adjusted from the control panel. There are no maximum limitations on package size because the machine has unlimited strap feed and takeup. As few as three small-diameter pipes can be handled.

The Model F4 fits easily into power conveyor systems. Items may flow to the machine from right or left. The machines are made for ⅜, ½, ⅝, or ¾ in. strap widths in gages from 0.015 through 0.023 in.

For more information, *write* Acme Steel Co., 135th Street and Perry Avenue, Chicago 27, Ill.

Brazing Alloy Has High Strength to 2000°F

APPLICABLE to most superalloys, Nicrobraze 170 produces high strength joints for continuous service up to 2000° F and can be used up to 2200° F.

Available in powder form (and best applied as a mixture with Nicrobraze cement), the material will braze tungsten and molybdenum-bearing alloys.

It provides improved ductility in the joint, produces small fillets, and has good wetting characteristics. Recommended brazing range is 2150 to 2200° F in dry hydrogen.

For more information, *write* Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich.

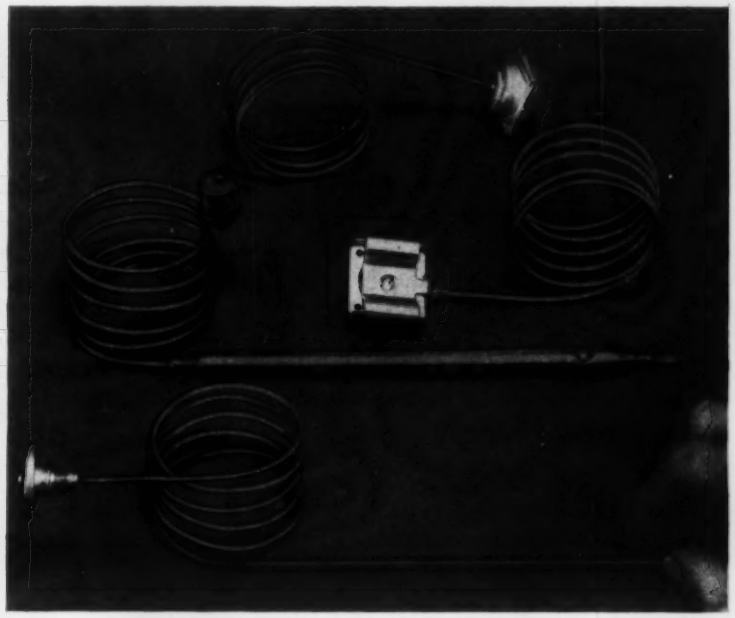
Gear Motors Are Vertical

WHEN gear motors must be mounted vertically on machines and equipment, this line of units will do the job.

They are available with flanged mounting face or vertical extended housing in ratings from 1 to 75 hp and reductions from 350 to 7½ rpm.

Built in dripproof, totally enclosed fan-cooled, or explosionproof designs, the motors operate at normal torque on two or three phase, 60 cycle, 208,

10 TO 15 NEW JOBS a week, each a different application, require a continuous program of evaluating the properties of metals and fabricating costs at Robertshaw-Bridgeport.



In making bellows (left) and temperature sensors (above) to meet ever-changing needs of control, appliance, and industrial equipment manufacturers, Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Milford, Conn., averages 10 to 15 new problems a week. Specifications vary widely in dimensions and physical characteristics. Dependable performance over long periods of uninterrupted service is vital—yet costs must be rigidly controlled.

So for quality with maximum economy in fabrication, materials must be matched precisely to the needs of each job. And in this, Robertshaw-Bridgeport looks to its suppliers for creative technical services. For many years, The American Brass Company specialists have been helping to select the correct alloys in phosphor bronze or brass and to meet fabrication problems in the making of bellows—to apply economically precision-made capillary tubing and other small-diameter copper tube in sensor assemblies. Through such services, The American Brass Company is constantly helping metal fabricators across the nation control quality while keeping costs down.

ARE you caught between cost reduction and quality control? Find out if you are buying metal properties you don't need. An Anaconda specialist may be able to suggest a lower cost alloy that fits the requirements of your job more closely. Or he may find that an adjustment of temper or a change in your fabrication methods can cut your costs. The services of Anaconda specialists are available through your American Brass representative. Call him in today, or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®

COPPER BRASS BRONZE NICKEL SILVER
MILL PRODUCTS

Made by The American Brass Company

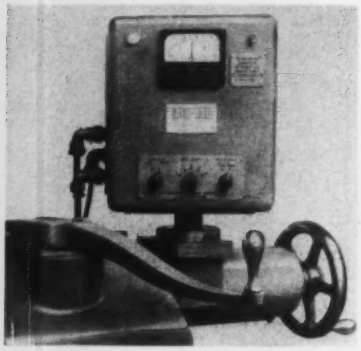
220/440, or 550 volts.

For more information, *write* Dept. 149, Lima Motor Co. Inc., a subsidiary of Consolidated Diesel Electric Corp., Lima, Ohio.

Grinder Attachment Corrects Work Taper

YOU CAN obtain exact alignment of the swivel table on Cincinnati center type grinders up to 48 in. in length with a taper-correcting attachment known as Gage Line.

Also applicable to the company's 4 to 14 in. plain grinders, and all sizes of its universal grinders, the attachment eliminates cut-and-try methods when grinding to precise straightness.



The unit consists of two gage heads, one mounted on each end of the swivel table, and an electronic control unit mounted on the bed. When the table is adjusted, the unit translates the signal from each gage head to a graduated meter, giving a direct reading for amount of movement and length of the workpiece.

For more information, *write* Grinding Machine Div., Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

Floor Resists Corrosion

IF ACID and alkaline solutions have been playing havoc with your plant floors, you might want to try a new flooring material that can withstand up to 50 per cent inorganic acid without corroding.

Called Stonclad, the material can take hot concentrated alkaline solutions up to 170° F and nitric acid up to 15 per cent. It will resist highly concentrated sulfate conditions. Added feature: The flooring will stand up under heavy traffic.

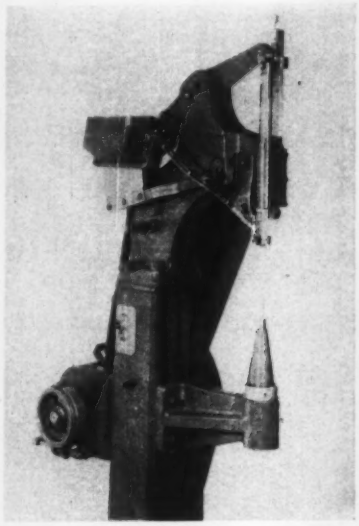
The material is packaged in three ready-mix parts which are combined at the job site. For more information, *write* Stonhard Co. Inc., 1306 Spring Garden St., Philadelphia 23, Pa.

Machine Feeds and Sets Long Tubular Rivets

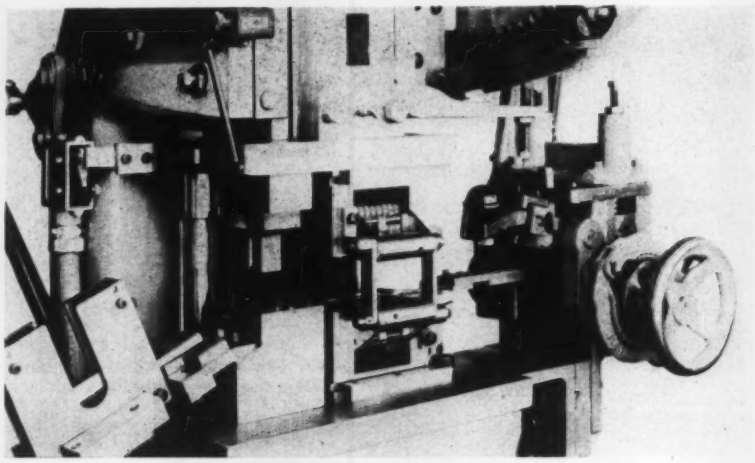
DESIGN improvements in the Model 95DP riveting machine provide trouble-free feed and control of long rivets with maximum work clearance.

With a 10 in. throat, blade hopper, and a choice of 4½ or 5 13/16 in. stroke, the unit will automatically feed and set semitubular and tubular rivets up to 0.260 diameter and 2⅝ in. long.

Because the clamping action does not take place until the riveting cycle has been actuated, the rivet hangs free and can be pushed aside when added clearance is needed.



The machine can be modified to feed and set rivets up to 5⅜ in. long when equipped with auxiliary feeding parts. For more information, *write* Tubular Rivet & Stud Co., Quincy 70, Mass.



Press Embosses Tags Automatically

THE Noblewest Model 507 makes embossed identification tags from brass wire stock automatically at production speeds up to 3000 an hour.

Built around a standard 10-ton back-geared press with roll feed, the machine has a multistation die set which includes the embossing head, hole punches, and parting dies to produce a complete tag with oval ends. Tags go into a pneumatic stacking chute, making it possible to remove them in consecutive order.

Special features of the press are a predetermining counter and special electropneumatic control circuit. You can set the counter to

better living with stainless steel

Now, at leading stores everywhere, you will see gleaming, carefree stainless steel in many new displays. New stainless cookware, flatware, tableware, ovens, hot plates, appliances and other beautiful things to make your home brighter, your living easier. Shop your favorite store and you will realize there is no substitute for stainless steel for homes and home products.

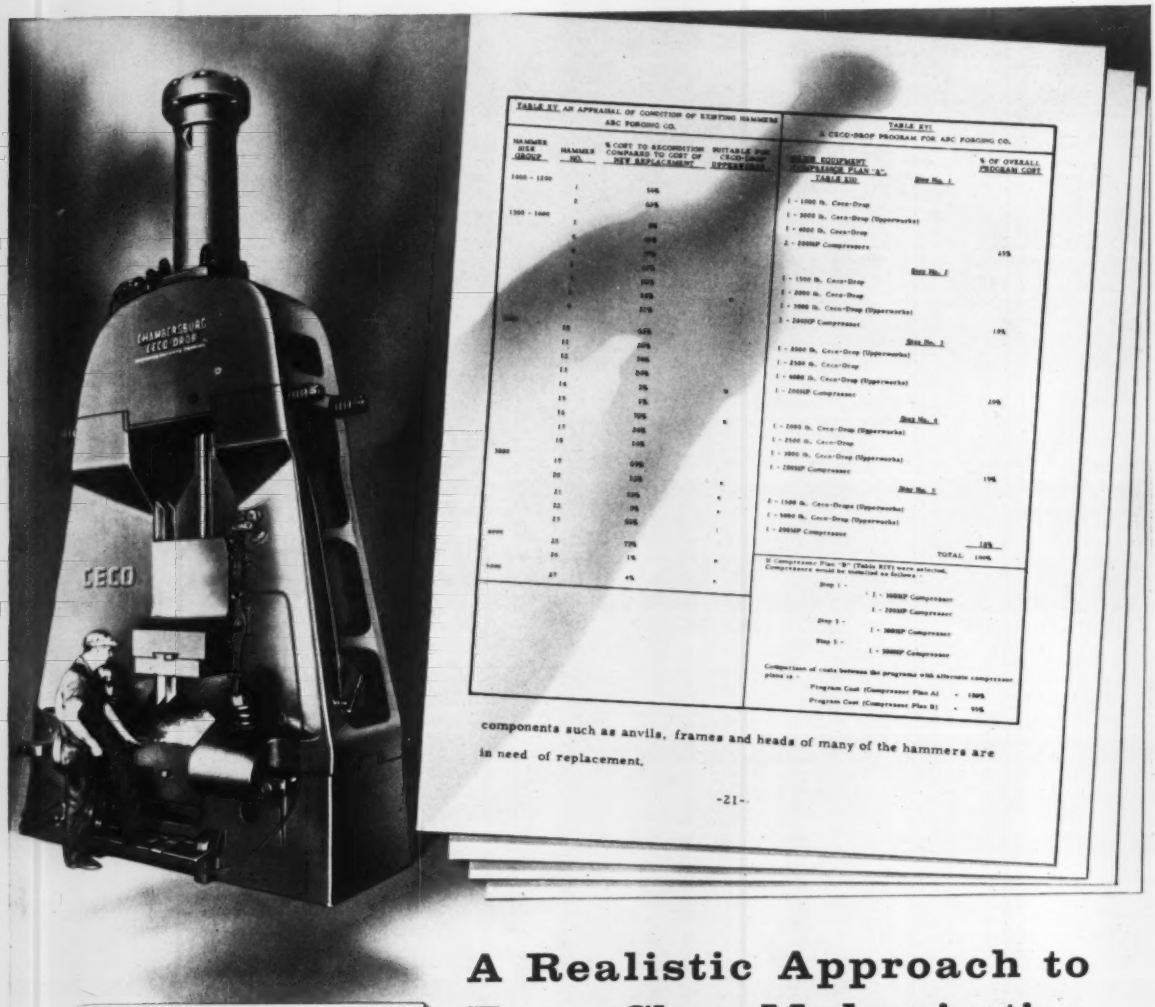
McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for homes and home products

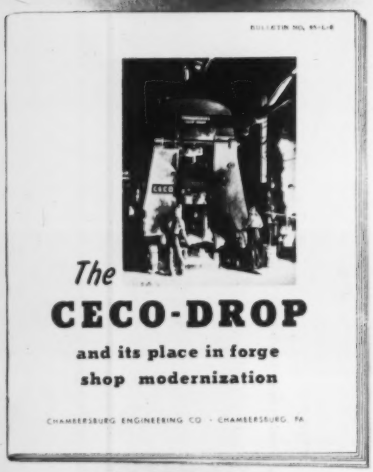
McLOUTH STEEL CORPORATION DETROIT, MICHIGAN

MANUFACTURERS OF STAINLESS AND CARBON STEELS



components such as anvils, frames and heads of many of the hammers are in need of replacement.

-21-



A Realistic Approach to Forge Shop Modernization

During the past few years, mounting competition has caused forge shop managers to seek ways to further increase production and reduce costs. A number have scrapped their old board hammers replacing them with Ceco-Drops, the modern piston-lift gravity-drop hammer. These shops have thus placed themselves in a position to get more business—and they are getting it! ● A wealth of helpful information is available in Chambersburg's new 28 page forge shop modernization bulletin. Based on studies made in prominent forge shops, this publication assists you to formulate your own step-by-step modernization program. Write for a copy today.

CHAMBERSBURG ENGINEERING COMPANY · · CHAMBERSBURG, PA.

run off a given quantity of tags automatically.

For more information, *write* Noble & Westbrook Mfg. Co., Westbrook Street, East Hartford, Conn.

Weight Printer Supplies Useful Cost Control Data

FULL identification of printed weights and other features of the Printweigh 400 scales can increase the effectiveness of cost control.

The unit prints weight data in large, clear figures on office forms or tickets up to 8½ x 11 in. It always prints a complete weight figure, even when unit weights are used to increase dial capacity.

To supplement basic weight information, these optional features are offered: Selective numbering, with six to 12 banks of keys; weight identifying symbols, actuated by a set of ten keys; automatic consecutive numbering; and automatic mechanism to record the time and date.

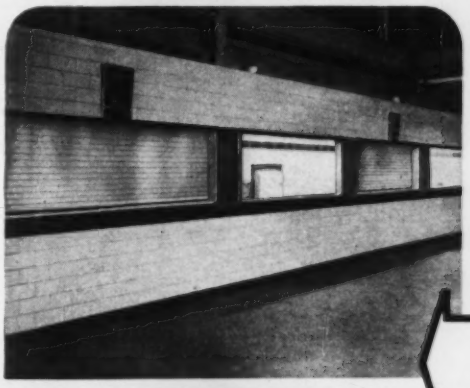
The scales also can be used for transmission of digital weight data to remote office machines. For more information, *write* Toledo Scale Corp., Toledo 13, Ohio.

Belts Are Free Rolling

CONVEYOR users can get rolling instead of sliding friction by using Roll-A-Load flat wire belts. On straight line conveyors, the belts can handle loads beyond the capacity of conventional flat wire or spiral woven metal belts.

Built-in rollers turn on the connector rod. The rod is positioned below the center line of the belt with the roller face projecting on the lower side of the belt only where

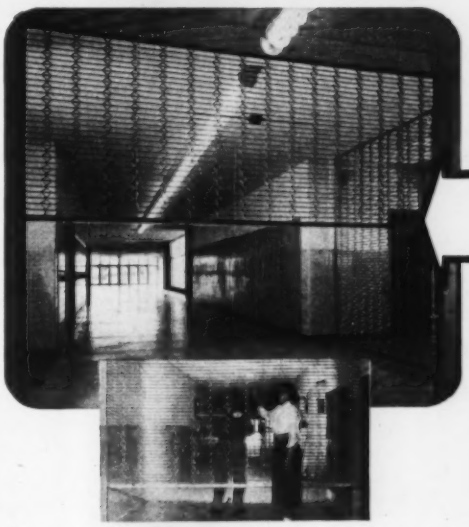
Best answers to these increasing needs:



Kinnear Rolling Counter Shutters

The vertical "coil-away" action of the *Kinnear-originated* curtain of interlocking metal slats is the ideal counter shutter. Its space-saving efficiency and protection have been proved in service openings of every kind. In addition to a variety of contoured slats, Kinnear also offers the popular "midget" slat, with a flat exterior face, specially designed for counters up to 20 feet wide.

and



Kinnear Rolling Grilles

The Kinnear Rolling Grille, an attractive openwork of metal bars and links, is also widely used as a barricade for counters, doorways, corridors, or to confine activities to sections of any room or building area. It features the same, space-saving, coiling upward action of the Kinnear Rolling Doors and Counter Shutters.

Kinnear Counter Shutters or Grilles — easily raised or lowered from inside — clear the entire opening . . . coil out of the way . . . never block light from above . . . leave all counter and wall space clear and usable at all times. In outdoor installations, wind can't slam or damage them. There's extra value in their **all-metal** protection against intrusion, pilferage or vandalism. Built of aluminum, steel, or other metals if desired, to fit openings of any size, in new construction or completed buildings. Write for further details.

The KINNEAR Mfg. Co.
FACTORIES:
1780-1800 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

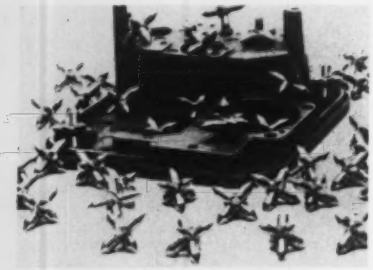
KINNEAR ROLLING DOORS
Saving Ways in Doorways

it provides rolling friction without interfering with the pay load.

For more information, *write* Ashworth Bros. Inc., Winchester, Va.

Cast Zinc Tumbling Media Finishes Holes and Recesses

THESE diecast tumbling media (called Multi-Stars) are made especially for precision barrel finishing of intricate castings with odd shaped holes or recesses. They can be used with all types of barrels and all types of metal, plastics, and rubber.



Unlike stones or steel media which transfer shock, the zinc media has shock absorbing characteristics which eliminate impingement.

Multi-Stars measure 1¼ in. from point to point. The diameter of each point body is ¼ in.

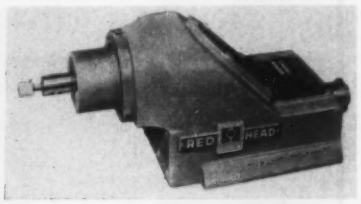
For more information, *write* BMT Mfg. Corp., 110-112 E. Ninth St., Elmira Heights, N. Y.

Belt-Driven Wheelheads Rotate at 100,000 rpm

YOU DON'T need expensive high frequency equipment to grind small holes at precise surface speeds. Interchangeable cartridge type wheelheads develop spindle speeds of 45,000 to 100,000 rpm.

Three separate speeds for each of the two cartridges are obtained by pulley changes. Ease of cartridge interchange and speed changing within the range of each cartridge make the wheelheads desirable where frequent setup changeovers are necessary.

The basic wheelhead consists of a jackshaft and body unit, and

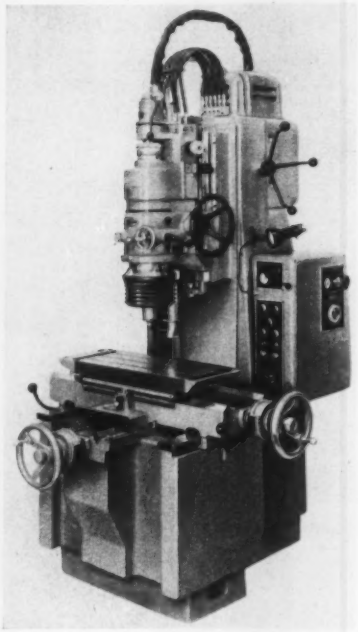


the spindle cartridge. For more information, *write* Heald Machine Co., 6 New Bond St., Worcester 6, Mass.

Jig Grinder Features High Accuracy Finishing

YOU CAN grind straight or tapered holes and regular or irregular contours to split-tenth accuracy with the No. 3 Moore jig grinder. It provides the same accuracy for slot and chip grinding operations.

The advance in accuracy is made possible by closer locational tolerances built into the machine. Maximum error in longitudinal or cross travel is 30 millionths of an inch per inch.



In a test, four holes in a plate were ground on the machine. The locations, 4 and 6 in. apart, were measured by five men. The maximum difference among the five sets of measurements was 30 millionths.

For more information, *write* Moore Special Tool Co. Inc., 800 Union Ave., Bridgeport 7, Conn.

NEW literature

Write directly to the company for a copy

Solid Polyurethane

An 8-page folder reviews the processes involved in fabricating parts from solid polyurethane, describes industrial applications, and gives case histories of parts made from the material. Marketing Services Dept., Disogrin Industries Inc., 510 S. Fulton Ave., Mt. Vernon, N. Y.

Brass Rod Mill Products

"For Your Metal Money's Worth," a 24-page booklet, lists weight, size, tolerance tables, specifications, and other technical data on brass rod mill products. Customer Service Div., Titan Metal Mfg. Co., Bellefonte, Pa.

Adhesives, Coatings, Sealers

A 12-page catalog gives typical applications and general characteristics of adhesives, coatings, and sealers. Adhesives, Coatings & Sealers Div., Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.

Coated Abrasives

Information kit makes it easier to specify and order coated abrasives. Form A 1506-1510 gives selectors, reference tables, and forms for listing your requirements. Carborundum Co., Niagara Falls, N. Y.

Magnetic Drill Stands

Four-page bulletin gives the applications of magnetic drill stands. Thor No. 10406. Thor Power Tool Co., 175 N. State St., Aurora, Ill.

Corrosion Data for Alloys

New 40-page booklet shows penetration rates for Haynes alloy No. 25 and Multimet alloy in over 250 corrosives. Haynes Stellite Co., a division of Union Carbide Corp., Kokomo, Ind.

Cold Saw, Milling Machines

Bulletin 537-A describes Newton cold saw machines for cutting ferrous and nonferrous metals. Bulletin 675-A discusses a line of special Newton milling machines. Consolidated Machine Tool Div., Farrel-Birmingham Co. Inc., 565 Blossom Rd., Rochester 10, N. Y.

Buffing Costs Can Be Cut

A 6-page booklet illustrates automation in polishing and buffing. It describes machines for continuous straight line, rotary, or reciprocating action. Wilson Buffing Chuck & Machine Co., 22730 Dequindre, Warren, Mich.

Rotary Cutting Tools

Catalog lists complete line of carbide and high speed steel rotary cutting tools. Rico Tool Co., 5915 Dixie Highway, Saginaw, Mich.

puts that "want-to-buy" gleam in their eye

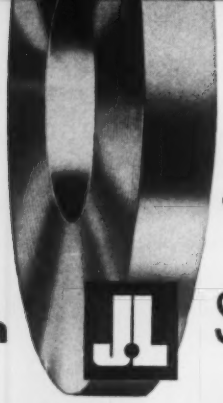
UNILOY
STAINLESS STEELS

The gleam in *her* eye reflects the brilliant beauty of stainless steel trim. The gleam in *his* eye reflects the protection that only stainless steel provides. Helps keep that "showroom look" for years.

Specify Uniloy stainless steel, produced by steelmakers who have been making specialty steels since 1884. This backlog of experience explains Uniloy's gleaming finish, why it is so easy to fabricate. For prompt delivery of Uniloy stainless steel rolled to your exact specifications, write or call our nearest sales office or warehouse.

UNIVERSAL CYCLOPS
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS



control your quality...

with J&L STAINLESS and STRIP DIVISION

cold rolled spring steel

The quality of your spring steel parts or products is only as good as the spring steel itself—its response, its performance. When you specify J&L it means all the advantages of most exacting quality control—from ore to finished coil. Particularly important is the opportunity to utilize J&L's Restricted Specification processing to achieve the qualities necessary for optimum end-results. With individual restricted specifications met, oftentimes production operations can be simplified and in many instances product quality improved. As an example look at this . . .

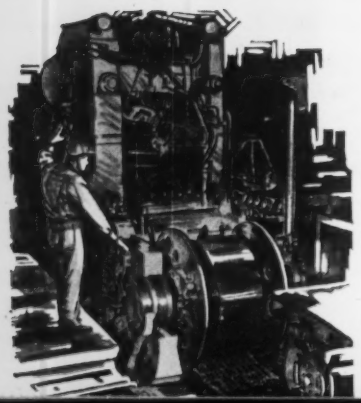
TYPICAL APPLICATION . . .

product	specification	results
Hardened control bar	Spring Steel Analysis—AISI—1050 annealed Size 4½" x .042 Tolerance ± .0003 including crown Width tolerance ± .005 Temper—B78 Max. Finish—#2 Coil size 250/300 lbs. per in. width	Uniformity of shape and gauge made possible change from cut lengths to coils, reducing handling and inspection. Increased speed of production line. Amazing thickness control eliminated 2 quality control stations.

J&L STAINLESS and STRIP DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

Low Carbon	Electrolytic Zinc
High Carbon	Alloy
Tempered Spring Steel	Stainless

The experience, facilities and accumulated know-how of a specialized organization devoted exclusively to strip steel processing are available to work with you. In this clearing house of strip steel engineering and application information, it's a good bet there is something of value for you. Your inquiry will get our immediate, interested attention.



STRIP J&L STEEL

Jones & Laughlin
STEEL CORPORATION
STAINLESS and STRIP DIVISION
YOUNGSTOWN 1, OHIO

Buying Surge Amazes Steelmakers

February 9, 1959

ORDER BOOKS are filling up so rapidly that steelmakers fear they won't be able to satisfy their customers. Demand for sheets has reached such a pitch that most mills are allocating tonnage. Some are sold out of all flat-rolled products through June. Not since the fall of 1956, when consumers were scrambling to replenish strike-depleted inventories, has the industry seen such a buying rush.

AUTOMAKERS SPUR BUILDUP—Although they're building their own inventories at a liesurely pace, automakers are urging their suppliers to accumulate steel in a hurry. Manufacturers of parts are expected to lay in enough metal by June 30 to carry them through initial runs on the 1960 cars. A major supplier is authorized to buy all the steel it will need through October on this schedule: 40 per cent for March delivery, 40 per cent for April, and 20 per cent for June.

The Big Three will introduce small cars in the fall, but chances are they won't need additional steel. They'll make room for them by dropping some of their less popular standard models.

SMALL USERS: BIG ORDERS— Knowing they must compete with automotive and appliance steel buyers in a tight market, small consumers are ordering bigger tonnages for first half delivery than business conditions warrant. In some cases, they're placing duplicate orders. Steelmakers react by allocating tonnage and refusing orders that are much in excess of a buyer's normal requirements. Although allocation protects key customers, it sometimes penalizes the small buyer. Case in point: A Chicago fabricator was told that he could have only 30 tons of cold-rolled sheets a month despite his estimate that a job he has will require 325 tons in the second quarter.

PLATES IN UPSURGE—In the last few weeks, demand for plates has picked up tremendously. A major producer describes the surge of orders as "dramatic." Sales executives say the turnabout is almost unprecedented. Sheared plate mills are booked through February and filling quickly for March. Some producers expect full operations through June. In Texas, plates are on allocation. In Chicago, they're in strong demand for welded pipelines, tanks, and freight cars. Deliveries on the common grades average about six weeks in the Pittsburgh area. In the East, sales are slow and deliveries considerably quicker.

STRUCTURALS GAIN, TOO—Structural mills still have surplus capacity, but they're enjoying better business than they've had in months. Standard structurals are on the upswing because of the increased tempo of carbuilding. (New York Central Railroad and a subsidiary have ordered 1500 hoppers at a cost of $13 million.) In the Midwest, road building is the main support of the structural market. Shapes are sluggish because of the dearth of industry construction.

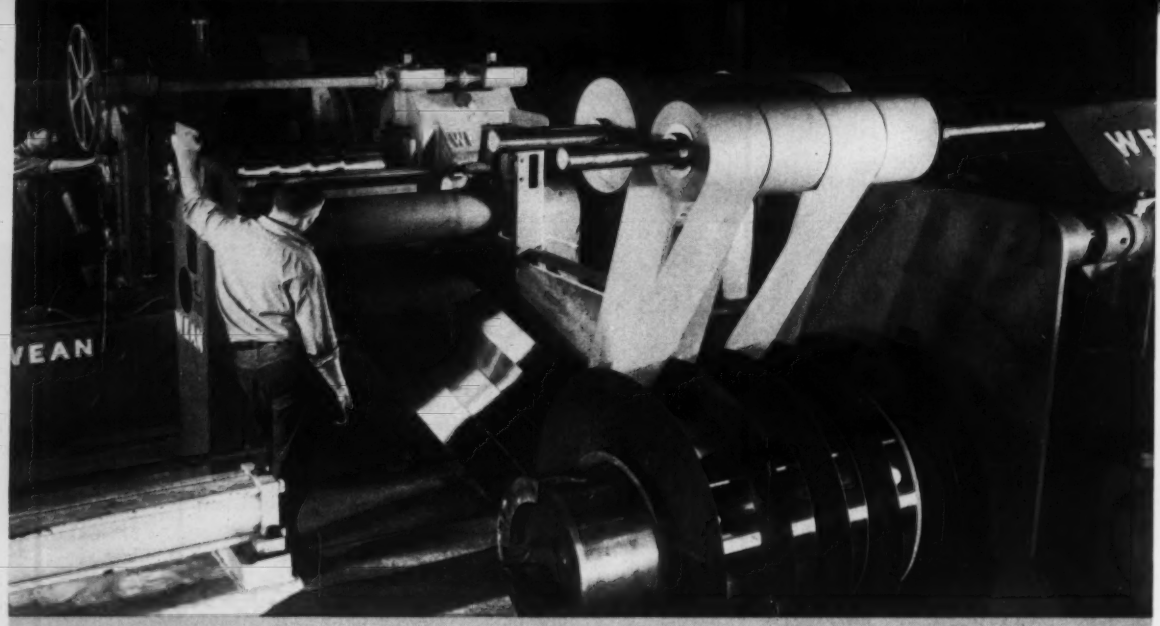
DRILLERS REPLACE STOCKS—Oil companies are moving ahead with their drilling programs and placing substantial orders for tubing and casing. (They don't need much drill pipe because many of their rigs were idle last year.) Last month, one tubemaker booked more tonnage than it shipped in the fourth quarter of 1958. As users increase their inventories, they'll buy more steel from mills and less from downriver terminals. Reason: They'll be more concerned about transportation costs than speed of delivery.

INGOT RATE ADVANCES—Last week, steelmaking operations climbed 1 point to 79 per cent of capacity. Production was about 2,237,000 net tons of steel for ingots and castings, the largest of any week since June 3, 1957.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	111	114
Reinforcing	...	115
Boiler Tubes	...	117
Clad Steel	...	118
Coke	125	122
Coal Chemicals	...	122
Charts:		
Finished Steel	...	113
Ingot Rate	112	...
Scrap Prices	...	125
Comparisons	...	113
Contracts Placed	131	...
Contracts Pend.	131	...
Electrodes	...	122
Fasteners	...	117
Ferroalloys	...	*
Fluorspar	...	122
Footnotes	...	117
Imported Steel	...	122
Ingot Rates	112	...
Metal Powder	...	122
Nonferrous Met.	128	130
Ores	112	122
Pig Iron	125	120
Piling	...	114
Plates	109	114
Plating Material	...	131
Prestressed Strand	...	*
Price Indexes	...	113
Producers' Key	115	...
R.R. Materials	...	117
Refractories	...	122
Scrap	124	126
Semifinished	...	114
Service Centers	112	120
Sheets	109	115
Shipments, Steel	112	...
Silicon Steel	...	116
Stainless Steel	...	118
Strip	109	116
Structurals	131	114
Tin Mill Prod.	112	116
Tool Steel	...	118
Tubular Goods	110	118
Wire	111	116

*Current prices were published in the Feb. 2 issue and will appear in subsequent issues.



Jones & Laughlin Steel Corp.

Sheets, vs. Strip--Industry Shipments

(Thousands of net tons)

	'58	'57	'56	'55	'54	'53	'52	'51	'50
Cold-Rolled Sheets (carbon)	10,000*	11,701	13,099	14,964	9,466	11,030	7,812	9,421	9,118
Cold-Rolled Strip (carbon)	800*	1,057	1,318	1,451	1,104	1,916	1,548	1,856	1,704

*Estimated.

Why Sheet, Strip Mix Is Changing

SHIPMENTS of cold-rolled carbon strip fell to a postwar low last year (about 800,000 tons), but producers aren't desperate. The market's in transition, they admit, but it's not about to vanish.

Last year's drop resulted partly from the recession but also reflected increasing competition from cold-rolled sheets. As technology advances, the newer sheet mills are maintaining closer tolerances than ever before and producing better finishes. Consumers have discovered that they can substitute sheets for strip in many jobs where precision isn't critical. They're buying narrow widths slit from coils by mills and service centers. In some cases, they've installed their own slitters.

• **Saves Money** — Fabricators can cut their costs materially when slit sheets are good enough for the job. Case in point: The base price of 16 gage, cold-rolled carbon strip is $23 a ton higher than that of sheets. In addition, strip has higher width extras. If a buyer wants 3 to 6 in. strip, he pays an extra of $23 a ton. If he buys 36 to 48 in. sheet coils, he pays $9. Slitting might cost him $8 a ton (or $5 if he does it himself), but he's still $29 to $32 ahead on the switch to sheets.

"The buyer pays more for cold-rolled strip than for sheets," a steelmaker admits, "but he gets more in return. In some cases, he gets a finish as a standard in strip which he'd have to pay extra for in slit sheets. He gets single strand rolling, choice of edges, and tolerances which can be held to two-thirds of slit sheet tolerances.

"Despite these advantages, I doubt that there will ever be another strip mill built by an American steel company. The trend will continue to be in the direction of sheets and away from strip. We make both, so we can be impartial about it. I doubt that cold-rolled

strip's use will ever be greater in tons than it has been in the last few years. It will continue to have uses where consumers need special quality, but these uses won't increase over the years."

Counters W. J. McCune, vice president-commercial for Sharon Steel Corp.: "Gains of cold-rolled sheets in the strip market have about leveled off."

• **Plain Finishes Hit Hard** — The No. 1 and No. 2 finishes in strip have been taking the brunt of slit sheet competition. Alloys and stainless have been holding their own. The higher finishes (such as No. 3, "appliance grade") and coated products have held their own or have been on an uptrend.

Slit sheets began to encroach on the strip market at the end of the war. With converters on allocation, manufacturers who wanted strip began to look elsewhere. If all they needed was close tolerance, they could ask a warehouse to slit a wide coil and select material that would meet their requirements. Custom slitters charged up to $40 a ton for their service, a practice which convinced many fabricators that they'd have to buy their own slitting equipment. Slit sheets gained additional popularity in 1954, when steelmakers made sheet prices applicable to material as narrow as 2 in. (Previously, sheets less than 12 in. wide were sold at strip prices.)

During the recession, service centers discovered that they could cut their inventories by carrying wide coils and slitting them to widths specified by customers. Ten years ago, they bought 7 tons of cold-rolled sheets for every ton of strip. Today the proportion is 30 to 1.

• **Warehouses, vs. Strip Mills** — Opinion is sharply divided on the question of whether service centers compete with strip mills, but there's no denying that they're boosting their sales of slit sheets. An eastern warehouser says "all" his customers are buying it—particularly stampers, office equipment makers, and electronic manufacturers. Reason: He offers "as good" finishes and tolerances as strip producers and guarantees quality. His customers don't save anything (they pay strip prices) but get quicker delivery than mills provide. Citing a "tremendous" trend toward use of slit sheets in place of strip, a Chicago warehouse says sheet mills have improved their gage uniformity and are offering additional finishes.

• **Strip Producers Confident** — Despite the growing popularity of slit sheets, strip producers radiate confidence. Says one: "We'll hang onto our markets because there's no substitute for strip when the customer wants precision, uniformity of thickness, and a good finish. In the automotive and appliance industries, appearance sells the product. Fabricators can't get a good shine on sheets unless they do a lot of buffing. They can get it as a standard in strip."

"The areas of specialization are emerging as sound," says a neutral observer. "You can't touch them with cold-rolled sheets. The trend is toward smaller tonnages of the more highly specialized products (dipped, lacquered, painted, galvanized, plated, and pattern rolled strip) while the commodities are being produced as commodities."

In early January, strip producers moved to meet the competition of slit sheets by tightening tolerances on strip, in some cases by as much as 50 per cent, without changing extras. By improving specifications, they expect to recover some of the business.

Consumers have had sad experiences (such as broken dies) with slit sheets, a strip seller declares. "That's an extra cost that more than offsets the advantages claimed for sheets." Service center competition can be overcome by aggressive salesmanship, a strip mill executive believes.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 115 & 116

A veteran Pittsburgh steelman says he hasn't seen anything like current sheet buying.

Smaller consumers are more concerned about stocks than the larger buyers. They're rushing the market with strike-hedge orders, many aiming for 90-day inventories of sheets and strip by the end of June. But the larger interests are adhering closely to their established buying programs.

While sheetmakers shy away from the word "allocation," tonnages are being allotted on a historical buying pattern, notably cold-rolled and galvanized sheets. That's to prevent overbuying and to assure equitable distribution among customers. Hot-rolled sheet deliveries extend six to eight weeks and are in the tight supply category.

Behind the ordering rush is the fear of a steel strike at midyear. But even though a strike should be averted, it's thought higher labor costs will force prices upward; that consideration alone is stimulating forward buying.

Cold-rolled sheets are being ordered by manufacturers of such things as appliances, air-conditioning equipment, door bucks, furniture, and office equipment. Container makers have stepped up their requirements, and the steel service centers are ordering more freely. A good flow of automotive orders is being booked, but there's no scare buying by that industry.

Pressure for galvanized sheets is strong. Most mills have booked orders that'll carry them through second quarter. Some zinc-coated specialties are booked through the first half. Enameling stock and electrical sheet deliveries now require seven to eight weeks.

Bids close Feb. 11 on 257,000 steel drums (55 gallon, 16 gage) for Quartermaster Purchasing, General Depot, Columbus, Ohio. An equal number of drums is being reserved for fabricating firms in labor surplus areas.

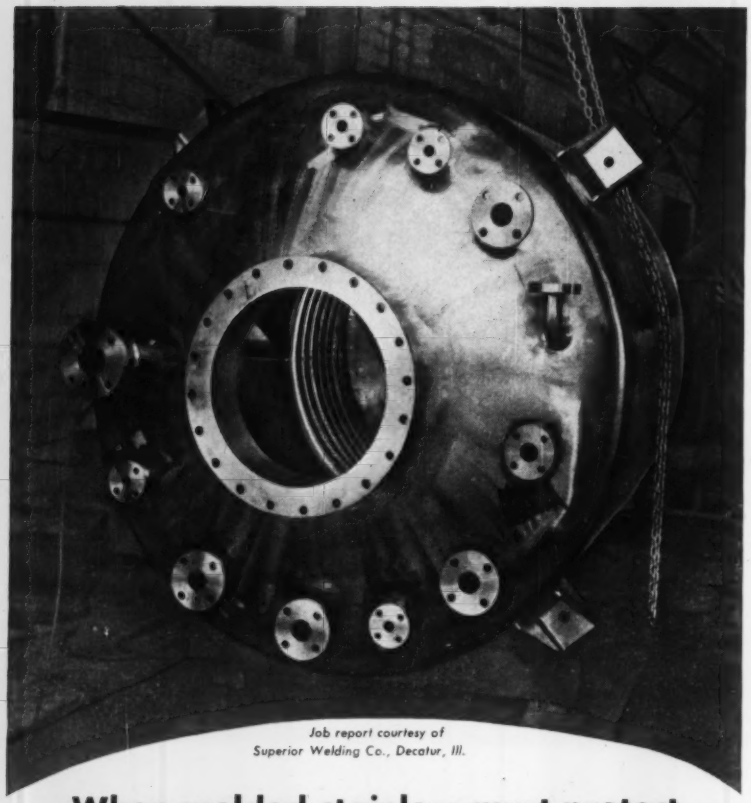
Plates . . .

Plate Prices, Page 114

Quickening demand for plates is spreading to the East. The pickup started in the Midwest and Southwest, and later extended to Pittsburgh. Buying pressure is up, and deliveries now run two to six weeks.

Mill capacity is filling up at some points. In the Southwest, the leading mill is on allocation. At Pittsburgh, a major platemaker says the surge in orders is "dramatic," the turnabout in demand being almost unprecedented. A district maker's sheared plate mills are booked up through February, and its March book is filling rapidly.

Platemakers attribute the im-



Job report courtesy of
Superior Welding Co., Decatur, Ill.

When welded stainless must protect the PURITY of the products handled

WELD WITH ARCOS

STAINLESS ELECTRODES

This highly polished kettle is fabricated from type 304 ELC stainless steel. In use, it must process chemicals without a trace of contamination. Arcos CHROMEND 19-9 Cb Electrodes were selected by the fabricator to assure a weld metal of high uniformity . . . one whose chemical composition would not break down under corrosive attack and contaminate the product. Welding was done by manual arc. When you, too, must safeguard product quality, specify Arcos Electrodes for the job. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

provement to: 1. General pickup in business. 2. Normal replacement of inventories. 3. Hedging against a possible midyear steel strike.

Tubular Goods . . .

Tubular Goods Prices, Page 118

A. O. Smith Corp., Milwaukee, has booked a $14.5 million order for about 375 miles of 24 in. diameter welded steel pipe from the Michigan Wisconsin Pipe Line Co., which supplies natural gas to utilities in Wisconsin, Michigan, and Iowa. The pipeline will require 20,000 tons of steel plates. About 250 miles of pipe will be fabricated in the company's Milwaukee pipe mill, and the remainder at the A. O. Smith Corp. of Texas plant at Houston. The utility will loop its present natural gas transmission line from Oklahoma to Cedar Rapids, Iowa.

Distributors of buttweld and seamless pipe are reported holding back orders for another month or so before covering against possible production losses at midyear in case steelworkers call a strike. Deliveries on both grades are prompt, from stock in most sizes.

Mechanical and pressure tubing shipments are more extended than they were, now running five to six weeks on mechanical tubing.

Utilities in New England are expected to cover their seamless pipe requirements this month. On the West Coast, large utility programs, calling for replacement of old lines and new installations, are expected to noticeably quicken the tubular goods market soon.

Consolidated Western's pipe mill at Provo, Utah, closed for several months, is scheduled to reopen by second quarter.

Municipal requirements for cast iron pipe are expected to equal last year's volume. Recently, Everett, Wash., placed 450 tons, and Tacoma, Wash., purchased a fair tonnage

A Pittsburgh producer of oil country goods booked more tonnage in January than it shipped in the fourth quarter of 1958. Consumers are ordering for inventory—not only as a hedge against a possible midyear steel strike but also because this is the season when oil drilling programs get started.

In the next few months customer

buying practices may change. As they increase their inventories, they'll be more concerned about lower transportation costs. Instead of ordering from downriver terminals, it's thought that they may order more tonnage direct from the mills for barge shipment.

Demand for oil country goods is concentrated in tubing and casing. There hasn't been much pickup in drill pipe. Producers say that's because many rigs were idle last year; a lot of extra strings of pipe are lying around.

Wire . . .

Wire Prices, Pages 116 & 117

Wiremakers are booking more tonnage, but the market is still far from the pressure stage. Some consumers are beginning to order for stockpile, but volume hedge buying (prompted by a possible midyear steel strike) is not expected to start until next month.

The increasing load on the wire mills has not resulted in extending deliveries noticeably on most carbon grades. There are still openings in February mill schedules. Most anticipatory orders are for finished wire products that require longer processing.

Steel Bars . . .

Bar Prices, Page 114

Trading in steel bars is better, though still on the sluggish side. Except for a few popular sizes, the mills haven't been under pressure for shipments, but deliveries are beginning to tighten.

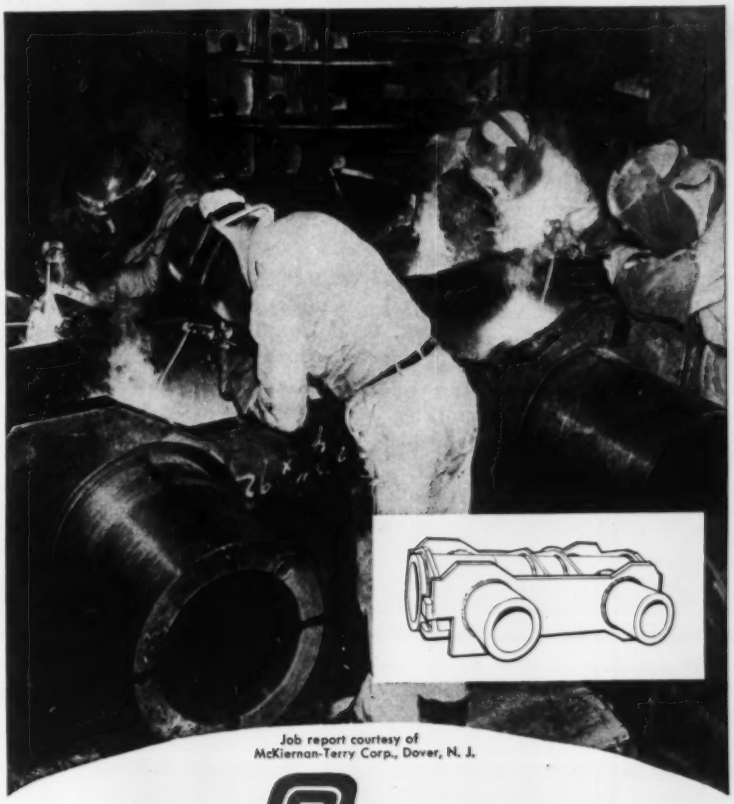
Although capacity is more than equal to demand, leadtime is stretching out, and buyers can't count on much under three weeks on the average. Second quarter shipments will be lengthened by forward ordering as a hedge against a possible midyear steel strike.

Demand from warehouses has not picked up noticeably, but fastener manufacturers' orders are fair.

Orders for cold-finished bars continue limited, but New England sellers say their February volume will top January's by 10 per cent. Cold-finishing operations are under capacity, 65 to 70 per cent being high.

Raritan Arsenal, Metuchen, N. J., closes Feb. 18 on 110 tons of alloy

When low alloy weld requirements are as *critical* as these



Job report courtesy of McKiernan-Terry Corp., Dover, N. J.

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

This crosshead weldment—part of a Navy steam catapult for launching jet fighters—must withstand the repeated powerful surges of steam under high pressure. Arcos Tensilend 80 electrodes were used to weld the SAE 4130 low alloy steel. After progressive magnaflux checking, and proper stress relieving, all welds were found to meet the high strength and toughness required for this kind of service. For the *right* weld metal—for the *right* welding techniques—for your tough welding problems—call on Arcos. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

bars. General Stores Supply Office, Navy, Philadelphia, closes Feb. 11 on 180 tons.

Tin Plate . . .

Tin Plate Prices, Page 116

With some producers of tin plate fully committed for the first six months of this year, demand continues heavy. The possibility of a steel strike this summer is causing consumers to press sellers for tonnage.

Metal can shipments in November totaled 315,806 tons, vs. 448,936 in October, and 284,774 in November, 1957, reports the Bureau of the Census. The movement for the first 11 months last year was 4,453,116 tons, vs. 4,303,447 in the like 1957 period.

Fruit and vegetable can shipments in November amounted to 75,475 tons, vs. 154,425 in October, and 67,026 in November, 1957. Shipments in the first 11 months last year were 1,488,019 tons, vs. 1,425,998 in the like period of 1957.

Shipments of beer cans (second largest category) totaled 52,122 tons in November, vs. 62,412 in October, and 45,678 in November, 1957. The total for the first 11 months last year was 759,305 tons, vs. 734,992 in the same period of 1957.

Distributors . . .

Prices, Page 120

Bookings of steel service centers are about 10 per cent ahead of where they were in the final quarter of 1958, a low volume period. The showing is disappointing when it's compared with the substantial rise in mill orders.

Although new business is slow, the supply of flat-rolled products is tighter.

Mills are attempting to restrain consumers from overstocking sheets by basing order acceptances on a historical pattern.

Iron Ore . . .

Iron Ore Prices, Page 122

Stocks of iron ore (from all sources) in the U. S. and Canada as of Dec. 31 totaled 68,833,658 gross tons, reports the American Iron Ore Association. They were only slightly larger than the 67,119,050 tons held on the same date the preceding year. Of the total, 65,841,574 tons were held in the U. S., vs. 64,036,404 the year preceding, and 2,992,084 tons in Canada, vs. 3,082,646.

There were 43,696,540 tons of Lake Superior ore at U. S. furnace yards and docks as of Dec. 31. That compares with 45,645,236 tons on the last day of 1957. Stocks of imported ore (other than Canadian) held in the U. S. amounted to 10,856,562 tons, vs. 7,475,695 the preceding year.

Consumption of iron ore in the U. S. and Canada last year amounted to 94,819,212 tons, vs. 130,901,646 the preceding year. Of the total, 53,672,900 tons were U. S. Lake Superior ore and 2,769,167 Canadian Lake Superior ore. Foreign ore (except Canada) use totaled 16,266,193 tons, vs. 19,515,972 in 1957.

1958 Steel Shipments Off

Shipments of steel products totaled 59,914,433 net tons in 1958, reports the American Iron & Steel Institute. Comparison: 79.9 million the previous year.

Electrolytic tin plate set a record at 5,040,190 tons, up nearly 8 per cent from the peak movement reported in 1957. Also larger were shipments of black plate, 621,096 tons, and of galvanized sheets, 2,828,848 tons.

The largest tonnage products shipped last year were: Cold-rolled sheets, 10,325,661 tons; hot-rolled sheets, 6,291,266 tons; hot-rolled bars (including light shapes), 5,646,563 tons; plates, 5,268,420 tons; electrolytic tin plate, 5,040,190 tons.

Among the four major markets for finished steel products which received larger tonnages during the year than in 1957, the outstanding gain was in shipments to the container industry. It took 6,568,583 tons, up 331,000 tons from 1957. Within that category, a record 5,252,071 tons went for the manufacture of cans and closures.

Other market increases compared with 1957: Contractors' products, 3,467,189 tons; agriculture, 1,193,114 tons; appliances, utensils, cutlery, etc., 1,590,095 tons.

The major market classifications last year were: Warehouses and distributors, 10,902,283 tons, equal to 19 per cent of total domestic shipments; automotive, 10,125,034 tons, or 17.6 per cent of the domestic total; and, construction, 8,722,549 tons, or 15.2 per cent.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

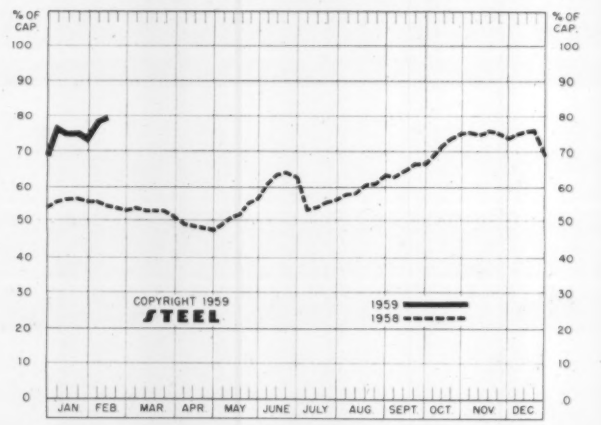
	Week Ended Feb. 8	Change	Same Week 1958	Same Week 1957
Pittsburgh	78	+ 1*	58.5	99
Chicago	86	+ 2*	59	96
Eastern	83	+ 7	75	98
Youngstown	69	+ 3*	52	102
Wheeling	81	+ 1	57	100.5
Cleveland	86	+ 2*	36	98
Buffalo	85.5	+ 5	51.5	107.5
Birmingham	72.5	+ 0.5	52.5	94.5
Cincinnati	94	+ 6*	41	87
St. Louis	92.5	— 2*	76	99.5
Detroit	93	+11*	53	101.5
Western	84	— 1	68	103
National Rate	79	+ 1	54	97

INGOT PRODUCTION‡

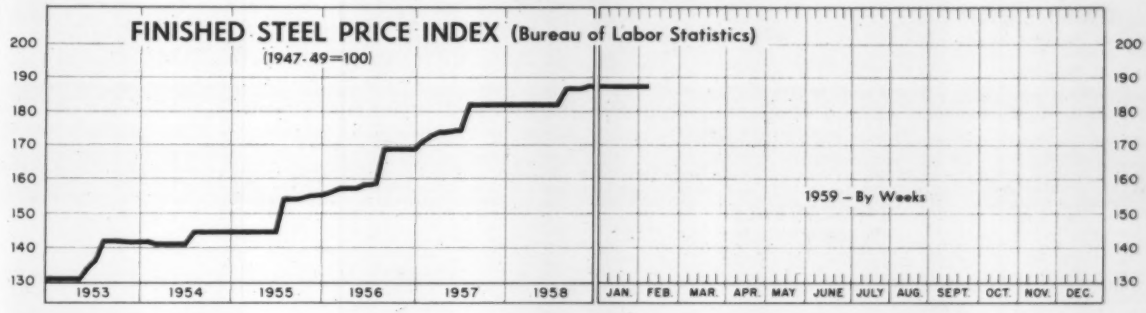
	Week Ended Feb. 8	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	140.4†	135.6	129.8	90.7
NET TONS (In thousands)	2,256†	2,178	2,085	1,457

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Feb. 3, 1959	Week Ago	Month Ago	Jan. Avg	Year Ago
187.0	187.0	186.9	187.0	181.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Feb. 3

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.695
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.903
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.583
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	26.157	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	206.608	Wire, Drawn, Stainless 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 4 1959	Week Ago	Month Ago	Year Ago	5-Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.91
No. 2 Fdry. Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	42.50	41.67	39.67	37.33	27.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Feb. 4 1959	Week Ago	Month Ago	Year Ago	5-Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ⅜-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	Feb. 4 1959	Week Ago	Month Ago	Year Ago	5-Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	59.66
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$43.50	$43.50	$42.50	$34.50	$29.50
No. 1 Heavy Melt, E. Pa.	40.00	39.00	34.00	38.50	27.00
No. 1 Heavy Melt, Chicago	44.00	42.50	42.50	39.00	27.00
No. 1 Heavy Melt, Valley	49.50	46.50	43.50	35.50	28.50
No. 1 Heavy Melt, Cleve.	44.50	43.50	39.50	31.50	26.50
No. 1 Heavy Melt, Buffalo	41.50	35.50	35.50	28.50	25.00
Rails, Rerolling, Chicago	64.50	62.50	62.50	54.50	36.50
No. 1 Cast, Chicago	49.50	47.50	45.50	42.50	29.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, Feb. 4, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 115, footnote, page 117.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B3 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....113.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11 ..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles P3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Struthers,O. Y1 .....8.05

H. S., L.A. Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 .....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L17 ....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O.(23) R2 .....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5 ..5.925
Lackawanna(9) B2 .....5.675
LosAngeles(9) B3 .....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 .....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 .....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ..6.125
Niles, Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra)

Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 .....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ...8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. (5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 .....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ....9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2 ..9.025
Hartford,Conn. R2 .....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ....11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 .....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill A7 .....9.025
Willimantic,Conn. J5 ...9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft. Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ...6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ...5.675

BARS, Reinforcing, Billet (Fabricated; to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ....7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00

McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt) L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ....5.575
Franklin,Pa.(4) F5 ....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 .....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 .....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ...5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 .....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ...5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ...5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1.7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ...7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1.6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1.9.275
Lackawanna(37) B2 ...9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
SparrowsPt.(39) B2 ..10.625
Pittsburgh J5 .....10.125

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Youngstown J5 .....7.50
Weirton,W.Va. W6 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ..... 6.775
Cleveland R2 ..... 6.775
Fairfield,Ala. T2 ..... 6.775
Gary,Ind. U5 ..... 6.775
GraniteCity,Ill. G4 .... 6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 ..... 6.775
Middletown,O. A10 .... 6.775
Niles,O. M21, S3 ..... 6.775
Youngstown Y1 ..... 6.775

BLUED STOCK, 29 Gage

Dover,O. E6 ..... 8.70
Follansbee,W.Va. F4 ... 8.70
Ind.Harbor,Ind. I-2 .... 8.70
Mansfield,O. E6 ..... 8.70
Warren,O. R2 ..... 8.70
Yorkville,O. W10 ..... 8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co., Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Norwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Follak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
New York W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

STRIP, Cold-Rolled Spring Steel (Tempered)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	10.55	11.70	13.90	16.90	19.85
Buffalo W12	10.55	11.70	13.90	16.90	19.85
Fostoria,O. S1	10.55	11.70	13.90	16.90	19.85
FranklinPark,Ill. T6	10.55	11.70	13.90	16.90	19.85
Harrison,N.J. C18	10.55	11.70	13.90	16.90	19.85
New York W3	10.55	11.70	13.90	16.90	19.85
Palmer,Mass. W12	10.55	11.70	13.90	16.90	19.85
Trenton,N.J. R5	10.55	11.70	13.90	16.90	19.85
Worcester,Mass. A7, T6	10.55	11.70	13.90	16.90	19.85
Youngstown S41	10.55	11.70	13.90	16.90	19.85

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)

Aliquippa,Pa. J5	7.90	8.10
Niles,O. R2	7.90	8.10

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	12.40	13.55	14.65
GranitoCity,Ill. G4	9.975*11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875 11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*11.70	12.40	13.55	14.65
Warren,O. R2	9.875*11.70	12.40	13.55	14.65
Zanesville,O. A10	.... 11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N. J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7 ... $10.30

NAILS, Cut (100 lb keg) To Dealers (33)

Wheeling,W.Va. W10 .. $9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
Rankin,Pa. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt., Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Sterling,Ill. (1) N15	177
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa. (43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill. (7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.75
Cleveland A7	17.85	
Craw'dsville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
Sterling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	9.10 9.775§
Bartonville(48) K4	9.10 9.775
Buffalo W12	9.00 9.55†
Cleveland A7	9.00
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown B2(48)	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48) B2	9.10 9.775§
Sterling(48) N15	9.25 9.925††
St'ling(1)(48) N15	9.15 9.825††
Struthers,O. Y1	9.00 9.65‡‡
Worcester,Mass. A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts

(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1¼ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1¼ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1⅛ in., incl.	57.0
1¼ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in. incl.	65.0
1 in. to 1⅛ in., incl.	57.0
1¼ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter ..+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

7/8 in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.28
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	28.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	31.50	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	29.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	32.75	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	34.00	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	34.50	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	38.25	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	39.75	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	51.25	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	63.75	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	51.25	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	62.25	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	41.50	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	22.25	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	34.75	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	22.50	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	35.55	42.05

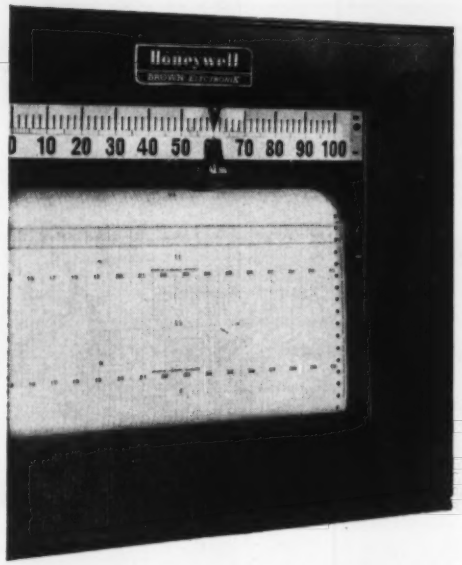
*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

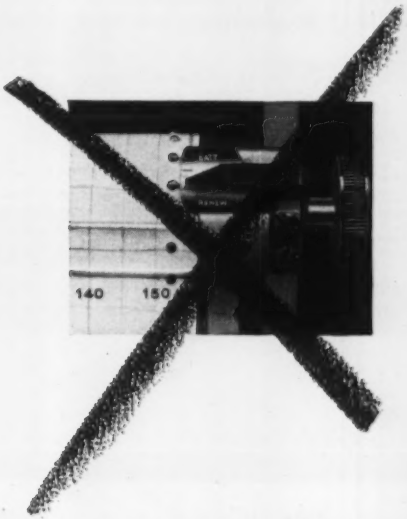
Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

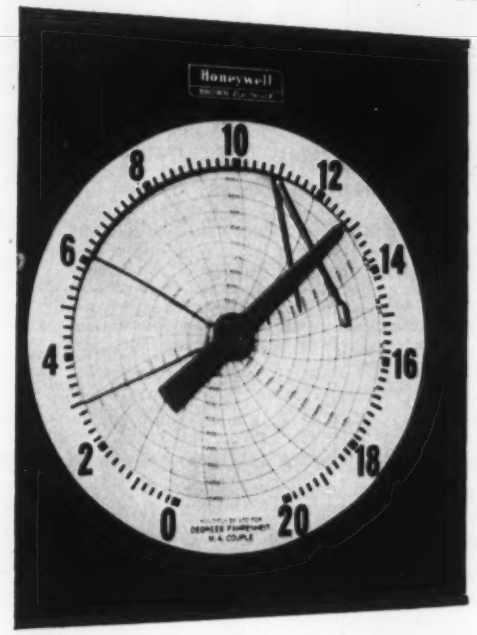
Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.





NOW! no batteries or standard cells in *ElectroniK* potentiometers



The new Honeywell Continuous Voltage Stabilizer makes batteries, standard cells, and standardizing mechanisms unnecessary in new Brown *ElectroniK* circular or strip chart potentiometers. This new unit accurately regulates the D-C reference voltage supply to the measuring circuit. Standardization is no longer necessary.

The small compact stabilizer unit uses Zener diodes and an ambient temperature compensator to deliver a constant rectified voltage from line supply. This enables the instrument to respond to changes in the measured variable without interruption.

Each Continuous Voltage Stabilizer means more dependability, less maintenance, continuous attention to the measured variable, and still another reason why *ElectroniK* instruments are your best value in measurement and control. Get complete details from your nearby Honeywell field engineer . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H HONEYWELL *First in Control*

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	9.31	10.40	11.97	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	11.10	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.35	11.55	12.55	57.38	10.80	11.05	14.70	16.80	10.25	10.15	13.05
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

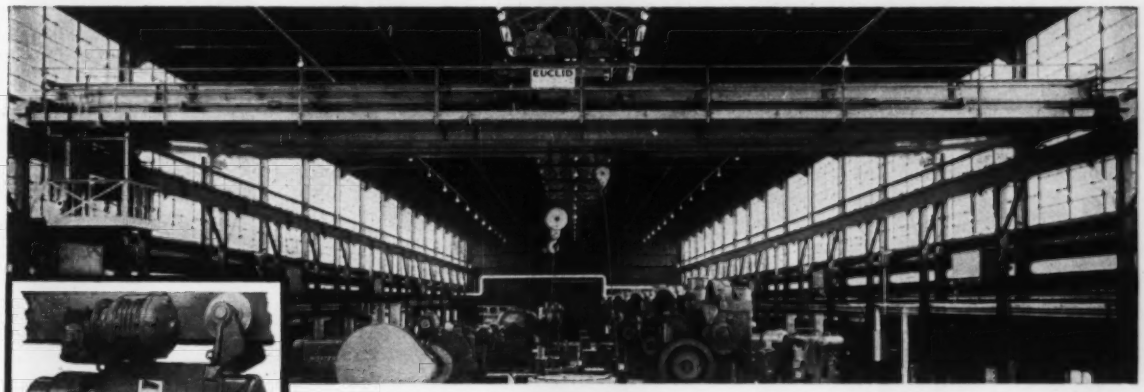
*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

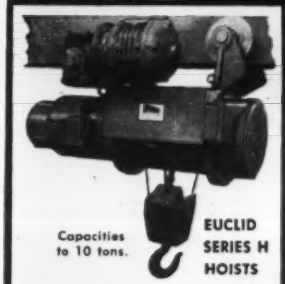
Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

that "NEEDED LIFT" can come from EUCLID CRANES & HOISTS TO "RAISE PROFITS"

You name the job or jobs to be done! We'll supply a crane or cranes that will do it. Standard Models in a wide range of styles, sizes and capacities will generally meet your requirements. If not, we'll engineer and build what you need. We've been doing it for more than 40 years.

GET A EUCLID PROPOSAL





Capacities to 10 tons. EUCLID SERIES H HOISTS

EUCLID HOISTS are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusual compact, rugged and accessible hoist readily adapted to various installations and types of control.

for Details & Catalog, write

THE EUCLID CRANE & HOIST COMPANY
1361 CHARDON ROAD • CLEVELAND 17, OHIO

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
69 Illustrations **Price $5.00 Postpaid**

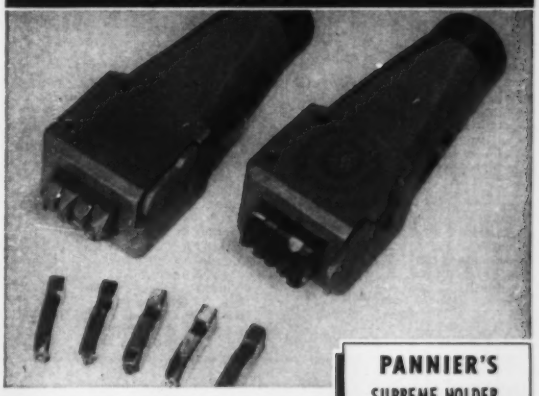
THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

MASTER MAKERS OF FINE BEARING METALS SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

ANOTHER PANNIER MASTER MARKER!



New Roto-Pin type lock is integral part of *all* Pannier Supreme Holders . . . eliminates loose, bent, dropped, or lost pins . . . flip it open to change type . . . flip it back to securely lock type in clear-marking position.

Write for complete data.

PANNIER'S SUPREME HOLDER WITH ROTO-PIN LOCK

Safe, fast type changing. Holder in variety of styles.
Machined from High-Grade Bar Tool Steel. Hardened anvil maintains type alignment.
Striking Head of Tool Steel . . . Replaceable to add long service life to Holder.

EIGHTMARKED MATERIALS

MARKING PANNIER DEVICES

THE PANNIER CORPORATION

220 Pannier Building • FAirfax 1-5185 • Pittsburgh 12, Pa.
Offices: Los Angeles • Chicago • Cleveland • Philadelphia • Birmingham

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farbar, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.25-$12.50*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.95-$1 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish:	
98% Fe:	
F.o.b. Camden or Riverton, N. J., freight allowed east of Mississippi river, ocean bags, 23,000 lb and over	11.25
Sponge Iron, Domestic, 98% Fe:	
F.o.b. Riverton, N. J., freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, in standard 200-lb containers; all minus 200 mesh	93.00-290.00
Aluminum:	
Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.00-48.90†
Bronze, 5000-lb lots	49.60-53.70†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.99-55.40†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

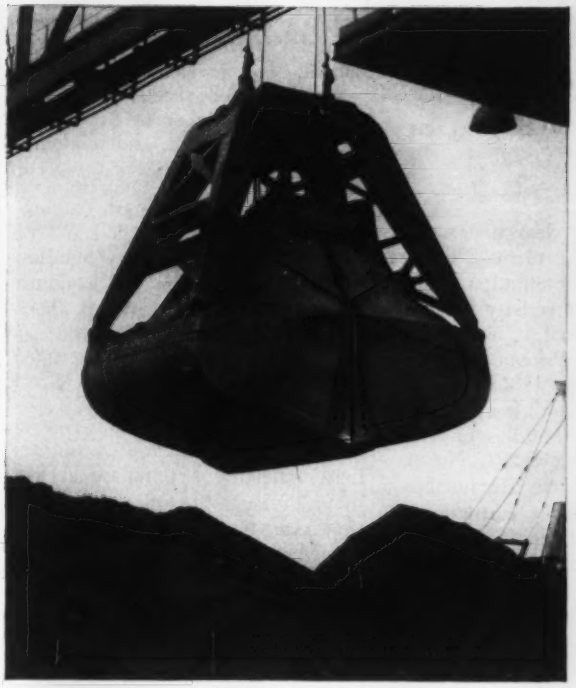
	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	*$5.40*	*$5.40*	*$5.30*	*$5.75*
Bar Size Angles	*5.10*	*5.10*	*5.00*	*5.43*
Structural Angles	*5.10*	*5.10*	*4.90*	*5.43*
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	*25.76*	*25.64*	*25.64*	*26.51*
Barbed Wire (†)	6.60	6.60	6.60	6.95
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	*5.19*	*5.32*	*5.14*	*5.49*
Wire Rods, O.H. Cold Heading Quality No. 5	*5.09*	*6.22*	*6.04*	*6.34*
Bright Common Wire Nails (§)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal., f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	22.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, del.	
Phenol, 90 per cent grade	15.50
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00



The Big Bite from Blaw-Knox... 680 cubic feet at one time

Custom-built at Blaw-Knox this huge clamshell bucket lifts enough coal in one bite to heat a seven room house located in a northern climate for a period of two years.

This four-rope, geared hinge, corner bar type clamshell is the largest of more than 400 varieties produced by Blaw-Knox that can be shipped completely assembled. Larger buckets must be delivered in sub-assemblies.

Capacity for any job has become a custom with Blaw-Knox. Every day, buckets designed and built at Blaw-Knox are performing profitably on the "tough" jobs all over the world.

A Blaw-Knox Bucket Engineer will be glad to help you select the bucket best suited to your operation. Contact him today or write for your copy of Blaw-Knox Bulletin number 2292.

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

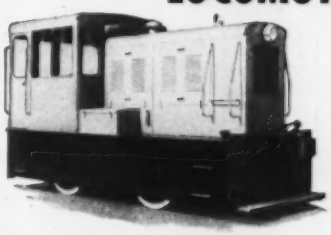
BLAW-KNOX

If METALWORKING PLANTS ARE YOUR PROSPECTS...

✓ ✓ ✓

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, O.

ADVANCED DESIGN distinguishes ROGERS INDUSTRIAL LOCOMOTIVES



Smooth high continuous tractive efforts are made available by hydraulic power-shift transmissions powered by modern heavy-duty diesel engines. Weights up to 40 tons. All gages. Modern distinctive all-welded construction. Low fuel cost, ease of maintenance and control.

Special designs custom built.
Write today for new literature.

ROGERS BROTHERS CORPORATION
ALBION, PENNA.
Export Office: 50 CHURCH ST., NEW YORK 7, N. Y., U. S. A.
Cable Address: Brosites

Scrap Jumps as Ingot Rate Rises

STEEL's composite on the prime grade, $42.50, is up for fourth straight week. Scrapmen expect heavy buying as steel operations hit best pace since June, 1957

Scrap Prices, Page 126

Chicago—Important steelmaking grades of scrap have advanced $1 to $2 a ton, based on mill purchases. The upsurge follows $51 bids of brokers for monthend offerings of No. 1 factory bundles. That was $4 above the last mill buying prices. Consumers are resisting the higher prices, and the highest price paid for factory bundles is $49, up $2 a ton.

A leading district steelmaker has announced $46 as its February buying price on No. 1 heavy melting steel of industrial origin, also up $2 a ton.

Sales of No. 1 railroad heavy melting at $48 compare with $46 previously.

Cast material is up $1 to $2, and the turnings grades are up $3.

It is increasingly clear that scrap consumers are going to resist higher prices with determination, and, as a result, market activity is likely to continue limited.

Philadelphia — Prices jumped again last week, No. 1 heavy melting rising to $40, No. 2 heavy melting to $37, No. 1 bundles to $41, No. 2 bundles to $26-$27, No. 1 busheling to $41, electric furnace bundles to $42, heavy turnings to $36-$37, No. 1 cupola to $39-$43, heavy breakable to $43, and malleable to $66.

New York — Brokers have advanced their prices on the major open hearth grades $1 a ton. They're offering $30-$31 for No. 1 heavy melting and No. 1 bundles, $27-$28 for No. 2 heavy melting, and $19-$20 for No. 2 bundles. The advances reflect better domestic and foreign shipments and optimism stemming from rising steel operations.

Stainless 18-8 sheets, clips, and solids are $5 higher at $190-$195; and 430 sheets, clips, and solids are up similarly at $80-$85.

Pittsburgh — Prices are surging. Brokers had to pay $51.37 for Fisher Body Div.'s factory bundles, $4.50 more than they bid a month ago. Railroad items are up about $3 a ton. A major wire producer bought scrap for the first time since June, 1957, paying $33 for No. 2 bundles.

Cleveland—Prices are up sharply here, reflecting a purchase at $49 by a Valley mill. On the basis of that sale, No. 1 heavy melting is quoted $44-$45 at Cleveland, up $1 from a week ago. Other steelmaking grades are up correspondingly.

The cast iron grades are strong, and prices have been advanced several dollars a ton on most items. Reasons: Foundry requirements are growing rapidly, and there's a short-

BUY DoALL TOP TOOL PERFORMANCE

Now, from one nearby reliable source nearly every need for metal working supplies, cutting tools, gages, surface grinders and band saw machine tools can be secured quickly and economically.

Industry benefits four ways from DoALL's greatly expanded program of service.

LOWER COST PURCHASING, FACTORY TRAINED SERVICEMEN AND SALES ENGINEERS, EACH ITEM LABORATORY INSPECTED, CONSISTENT TOP TOOL PERFORMANCE.

age of the cast grades due to restricted collections.

Youngstown—Material is moving sluggishly here, despite the noticeable upturn in district steelmaking operations. Prices are unchanged.

Detroit — The market is strong, but prices haven't moved upward as much as had been anticipated. That's because McLouth Steel's entry into the market was at half strength because of a recent strike shutdown. Brokers and dealers expect higher prices this month.

Aside from local transactions, the only major buy was by Copperweld Steel (Warren, Ohio) at $49, delivered. Great Lakes Steel put out an order for No. 2 bundles at $27.50. Isolated purchases of machine shop turnings at $24-$25 were reported, but the general market will not support those prices.

Buffalo—Increases of $2 to $3 a ton on the principal grades are indicated in this market. Dealer optimism stems from the pickup in steelmaking operations and strength at other scrap consuming centers. Mills have been starting up blast furnaces, but it's expected they'll have to supplement their increased hot metal output with scrap.

Cincinnati — With district steel mills actively in the market and prospects promising for a high steelmaking rate this month, the scrap market is bullish. No. 1 heavy melting went up another 50 cents last week, now being quoted $39.50-$40.50. Some No. 1 material has been sold for shipment out of the area. The district steel rate has topped [illegible] cent of capacity for the f[illegible]n more than a year.

St. [illegible]Mills are paying premiums for shipments from outside the district. This is serving to force local prices up; advances were scored last week by stove plate, up $1, and clean auto cast, up $2. Dealers are holding their scrap for better prices.

Birmingham—Prices on electric furnace scrap and some open hearth and foundry grades went up last week, but the market held on the cast iron grades. No. 2 grades of open hearth scrap advanced $2 a ton, and some brokers raised prices on No. 1 grades which were based on prices offered by northern mills. There's a little more activity in the export market.

Houston — Broker buying prices on heavy melting scrap grades are up $2 a ton on a mill order for February. The Houston steelmaker acted after another Texas mill entered the market with a springboard price that might have pulled scrap from Houston. The Houston increase is the first price change since the drop of $4 last December.

Brokers are wary about being caught short on any significant market change. Reasons: Exports are making something of a comeback. Mexican mills are buying in Texas occasionally. And there is general dealer dissatisfaction because of low prices.

San Francisco—The market undertone is stronger, but this has not been reflected in prices. One big mill is eating into its inventory, operating in the high 80s.

Seattle—The market gives no sign of an early revival. Mill orders are limited, and yard receipts are light.

Exports from west coast ports are small. North Atlantic and Gulf Coast shippers are reported underselling Pacific Coast exporters.

Cutter Blade Prices Cut

Reductions of 10 to 15 per cent in prices of standard Rigidcut milling cutter blades are announced by Wesson Co., Ferndale, Mich. The company says the introduction of automated equipment and processes made the move possible.

Pig Iron . . .

Pig Iron Prices, Page 120

Merchant pig iron sales were up in January and are expected to rise again this month. Consumers hold small inventories, but they are assured of prompt shipments for weeks ahead.

Production is rising. The seventh blast furnace at the Lackawanna, N. Y., plant of Bethlehem Steel Co. was blown in, leaving only three idle in the Buffalo district.

Kaiser Steel Corp. has placed in operation the fourth blast furnace at its Fontana, Calif., plant.

U. S. Steel Corp. has relighted No. 3 blast furnace at its Edgar Thomsom Works, Braddock, Pa. Five of the seven stacks at the works are now active. The No. 3 furnace had been out of production since July 3, 1958.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 122

Production of coke in November totaled 5,240,491 net tons (5,176,712 oven, and 63,779 beehive), reports the U. S. Bureau of Mines. In October, output was 5,107,768 tons (5,046,197 oven, 61,571 beehive), and in November, 1957, it was 5,630,500 tons (5,540,500 oven, 90,000 beehive).

Output in the first 11 months last year totaled 47,977,616 net tons (47,487,974 oven, 489,742 beehive), vs. 70,772,400 tons (68,763,200 oven, 2,009,200 beehive) in the like 1957 period.

Producers' stocks of oven coke at the end of November amounted to

(*Please turn to Page* 131)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Feb. 4, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Feb. 4	$42.50
Jan. 28	41.67
Jan. Avg.	40.58
Feb. 1958	37.33
Feb. 1954	26.91

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	*32.00-33.00*
No. 1 busheling	43.00-44.00
No. 1 factory bundles	*53.00-54.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	*51.00-52.00*
3 ft lengths	*50.00-51.00*
Heavy turnings	36.00-37.00
Punchings & plate scrap	*52.00-53.00*
Electric furnace bundles	*52.00-53.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*49.00-50.00*
Rails, 2 ft and under	*60.00-61.00*
Rails, 18 in. and under	*61.00-62.00*
Random rails	*58.00-59.00*
Railroad specialties	*53.00-54.00*
Angles, splice bars	*53.00-54.00*
Rails, rerolling	*61.00-62.00*

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 bundles	55.00-65.00

CHICAGO

No. 1 hvy melt., inuds.	*45.00-46.00*
No. 1 heavy melt, dealer	*42.00-43.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 factory bundles	*48.00-49.00*
No. 1 dealer bundles	*44.00-45.00*
No. 2 bundles	*31.00-32.00*
No. 1 busheling, indus.	*45.00-46.00*
No. 1 busheling, dealer	*42.00-43.00*
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	*26.00-27.00*
Short shovel turnings	*26.00-27.00*
Cast iron borings	*26.00-27.00*
Cut structurals, 3 ft	*51.00-52.00*
Punchings & plate scrap	*52.00-53.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*45.00-46.00*
Untripped motor blocks	*39.00-40.00*
Clean auto cast	*56.00-57.00*
Drop broken machinery	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*47.00-48.00*
R.R. malleable	*59.00-60.00*
Rails, 2 ft and under	*62.00-63.00*
Rails, 18 in. and under	*63.00-64.00*
Angles, splice bars	*55.00-56.00*
Axles	*72.00-73.00*
Rails, rerolling	*64.00-65.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-220 00
18-8 turnings	115.00-120.00
430 bundles & solids	115 00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 busheling	*49.00-50.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*33.00-34.00*
Machine shop turnings	*20.00-21.00*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Low phos.	*49.00-50.00*
Electric furnace bundles	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00

CLEVELAND

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	*46.00-47.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	31.00-32.00
No. 1 busheling	*44.00-45.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	42.00-43.00
Cut structurals, plates 2 ft and under	51.00-52.00
Low phos, punchings & plate	*45.00-46.00*
Alloy free, short shovel turnings	25.00-26.00
Electric furnace bundles	*44.00-45.00*

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Charging box cast	*41.00-42.00*
Heavy breakable cast	*41.00-42.00*
Stove plate	*44.00-45.00*
Unstripped motor blocks	*36.00-37.00*
Brake shoes	*39.00-40.00*
Clean auto cast	*50.00-51.00*
Burnt cast	*40.00-41.00*
Drop broken machinery	*53.00-54.00*

Railroad Scrap

R.R. malleable	66.00-67.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Rails, random lengths	55.00-56.00
Cast steel	52.00-53.00
Railroad specialties	53.00-54.00
Uncut tires	46.00-47.00
Angles, splice bars	*54.00-55.00*
Rails, rerolling	59.00-60.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	210.00-215.00
18-8 turnings	120.00-125.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	**37.00**
No. 2 heavy melting	**35.00**
No. 1 bundles	**39.00**
No. 2 bundles	28.00
No. 1 busheling	39.00
Machine shop turnings	21.00
Short shovel turnings	23.00

Cast Iron Grades

No. 1 cupola	**48.00**
Charging box cast	**40.00**
Heavy breakable cast	**38.00**
Unstripped motor blocks	**39.00**
Clean auto cast	*50.00*
Stove plate	*45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	45.50
Rails, 18 in. and under	52.00†
Rails, random lengths	47.50
Rails, rerolling	60.00
Angles, splice bars	49.00

BIRMINGHAM

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	33.00-34.00
No. 2 bundles	*23.00-24.00*
No. 1 busheling	33.00-34.00
Cast iron borings	14.00-15.00
Machine shop turnings	*23.00-24.00*
Short shovel turnings	*24.00-25.00*
Bars, crops and plates	*43.00-44.00*
Structurals & plates	*42.00-43.00*
Electric furnace bundles	*39.00-40.00*
Electric furnace:	
2 ft and under	*37.00-38.00*
3 ft and under	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	*50.00-51.00*
Rails, rerolling	56.00-57.00
Rails, random lengths	43.00-44.00
Angles, splice bars	*44.00-45.00*

PHILADELPHIA

No. 1 heavy melting	*40.00*
No. 2 heavy melting	*37.00*
No. 1 bundles	*41.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*41.00*
Electric furnace bundles	*42.00*
Mixed borings, turnings	21.00-22.00
Short shovel turnings	24.00-25.00
Machine shop turnings	21.00-22.00
Heavy turnings	*36.00-37.00*
Structurals & plate	43.00-44.00
Couplers, springs, wheels	44.00
Rail crops, 2 ft & under	57.00-58.00

Cast Iron Grades

No. 1 cupola	*39.00-43.00*
Heavy breakable cast	*43.00*
Malleable	*66.00*
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*19.00-20.00*
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Low phos. (structurals & plates)	34.00-35.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	23.00-24.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	*190.00-195.00*
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	*80.00-85.00*

BUFFALO

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*41.00-42.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*41.00-42.00*
Mixed borings, turnings	*19.00-20.00*
Machine shop turnings	*17.00-18.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*19.00-20.00*
Low phos. structurals and plate, 2 ft and under	*49.00-50.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	*49.00-50.00*
Rails, 3 ft and under	*55.00-56.00*
Railroad specialties	*48.00-49.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*39.50-40.50*
No. 2 heavy melting	*34.50-35.50*
No. 1 bundles	*39.50-40.50*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*39.50-40.50*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	22.00-23.00
Cast iron borings	*20.00-21.00*
Low phos, 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	*40.00-41.00*
Charging box cast	38.00-39.00
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Rails, 18 in. and under	*57.00-58.00*
Rails, random lengths	*50.00-51.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	*35.00*
No. 2 bundles	*22.00*
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	*42.00*

Cast Iron Grades

No. 1 cupola	*43.00*
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	*34.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	27.00-28.00
No. 1 busheling	27.00-28.00
Machine shop turnings	9.00-10.00
Short shovel turnings	11.00-12.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*39.00-40.00*
No. 2 bundles	*24.50-25.50*
No. 1 busheling	*38.00-39.00*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*16.00-17.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	33.00-34.00
Charging box cast	33.00-34.00
Heavy breakable	35.00-36.00
Unstripped motor blocks	22.00-23.00
Clean auto cast	47.00-48.00

SEATTLE

No. 1 heavy melting	**31.00**
No. 2 heavy melting	**29.00**
No. 1 bundles	**29.00**
No. 2 bundles	**23.00**
Machine shop turnings	**9.00-10.00†**
Mixed borings, turnings	**9.00-10.00†**
Electric furnace No. 1	**38.00†**

Cast Iron Grades

No. 1 cupola	**31.00†**
Heavy breakable cast	**28.00†**
Unstripped motor blocks	**23.00†**
Stove plate (f.o.b. plant)	**21.00†**

LOS ANGELES

No. 1 heavy melting	**36.00**
No. 2 heavy melting	**34.00**
No. 1 bundles	**33.00**
No. 2 bundles	**18.00**
Machine shop turnings	**15.00**
Shoveling turnings	**18.00**
Cast iron borings	**15.00**
Cut structurals and plate 1 ft and under	**47.00**

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	**47.00**

Railroad Scrap

No. 1 R.R. heavy melt.	**38.00**

SAN FRANCISCO

No. 1 heavy melting	**32.00-34.00**
No. 2 heavy melting	**30.00-32.00**
No. 1 bundles	**30.00-32.00**
No. 2 bundles	**22.00**
Machine shop turnings	**15.00**
Mixed borings, turnings	**15.00**
Cast iron borings	**15.00**
Heavy turnings	**15.00**
Short shovel turnings	**15.00**
Cut structurals, 3 ft	**40.00**

Cast Iron Grades

No. 1 cupola	**44.00**
Charging box cast	**34.00**
Stove plate	**34.00**
Heavy breakable cast	**28.00**
Unstripped motor blocks	**31.00**
Clean auto cast	**40.00**
Drop broken machinery	**40.00**
No. 1 wheels	**34.00**

HAMILTON, ONT.

(Brokers' buying prices)

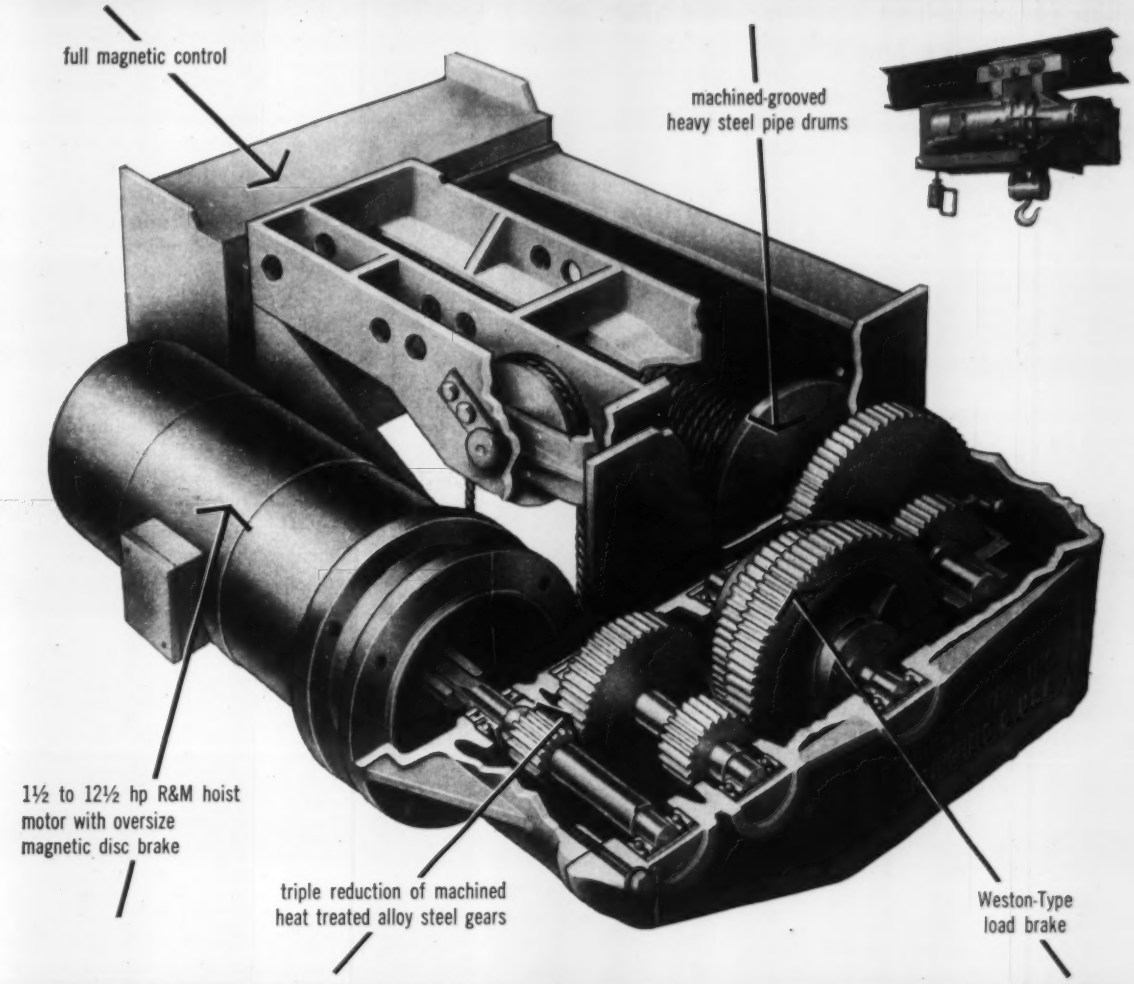
No. 1 heavy melting	**34.50**
No. 2 heavy melting	**30.50**
No. 1 bundles	**34.50**
No. 2 bundles	**25.00**
Mixed steel scrap	**26.50**
Mixed borings, turnings	**15.00**
Busheling, new factory: Prepared	**34.50**
Unprepared	**28.50**
Short steel turnings	**19.00**

Cast Iron Grades‡

No. 1 machinery cast	**39.00-41.00**

†Nominal.
‡F.o.b. Hamilton, Ont.

big hoist value



R&M Type F standard low-headroom hoists excel in the heaviest, most severe service. Frame is solidly braced welded steel. Special weather and dustproof R&M hoist motor runs cool, has the highest time rating found in any standard hoist—30 min., 55° C. rise. And the oversize magnetic disc type motor brake requires virtually no adjustment. Full magnetic control with reduced push-button voltage is standard. With lug mounting, Type F-2 headroom is only 16½" in 2 ton capacity.

Capacities: ½ to 10 tons. Speeds: 10 to 54 fpm. Lug mounting; push, hand geared or motorized trolleys.

Robbins & Myers, Inc., Hoist & Crane Div., Springfield, O.

take it up with

ROBBINS & MYERS

hoists cranes

Request Bulletin 801-C today

Copper Goes to 30 Cents

Strength overseas and continued good demand at home are major factors behind 1-cent-a-pound hike. Price is highest it has been since June, 1957

COPPER has bounced back from the recession with authority.

• **Gaining Strength** — The latest sign of strength came on Feb. 2 when Phelps Dodge Corp. raised the price of primary copper by 1 cent—to 30 cents a pound. The other two members of the "Big Three," Kennecott Copper Corp. and Anaconda Co., followed the next day. Brass and wire mills have made corresponding adjustments in their quotations.

The increase is the first since Oct. 23 when producers went up 1.5 cents a pound and the fourth bump since prices hit a recession low of 25 cents in January, 1958.

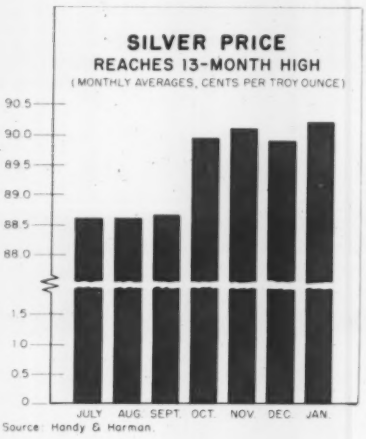
• **Behind the Move** — For some time, the question has been "when," not "if" prices would climb. Here's why: There has been continuing good demand for the red metal in recent months. Wire mills are running at a fast clip, and brass mill sales have perked up.

In addition, primary producers have picked up some of the business that would normally go to custom smelters. Two reasons: 1. Until the hike, the custom smelter quotation was 1 cent a pound over the primary. 2. Scrap has been in tight supply, limiting the amount of metal custom smelters have for sale. (Dealers are evidently holding back for higher prices.)

Finally, domestic quotations have been influenced by the strong prices quoted overseas. They're high enough to make it uneconomical to import copper into this country, which means more business for domestic sellers.

• **The Hitch**—The question nagging producers: How much of the current buying is for early consumption and how much is a hedge against a possible copper strike in the summer? (See STEEL, Jan. 19, p. 108.) Pessimists are scared by the prospect of slack demand and plummeting prices if customers lay in large stocks to last out a strike that doesn't take place.

But most sources discount hedging as a major factor right now. Their reasoning: Many customers still specify "immediate delivery." "They wouldn't be so concerned if adding to inventory was their objective," points out one observer.



Source: Handy & Harman

• **Turnabout** — Regardless of the reason, strong demand both here and overseas has put the red metal into a situation approaching tight supply. A few months ago domestic mines were creeping along on three and four day workweeks. Now they're operating on six and seven day shifts within a hair of full capacity. (Current U. S. primary and secondary output is running around 110,000 tons monthly.)

The switch in the supply-demand balance is pointed up by the change in producers' refined stocks. They've dived from a high of 253,463 tons in May to 80,722 tons at the end of December. Some quarters feel stocks have fallen below a "safe" level. They believe a minimum should be 100,000 tons.

• **What To Expect**—Copper may get in even tighter supply, but recently increased output should guarantee enough metal to go around. Look for price stability in primary for the moment with chances fairly good for another hike in the spring if business improves as hoped. Custom smelters may be forced to bump their prices to get more scrap.

Silver Price Up

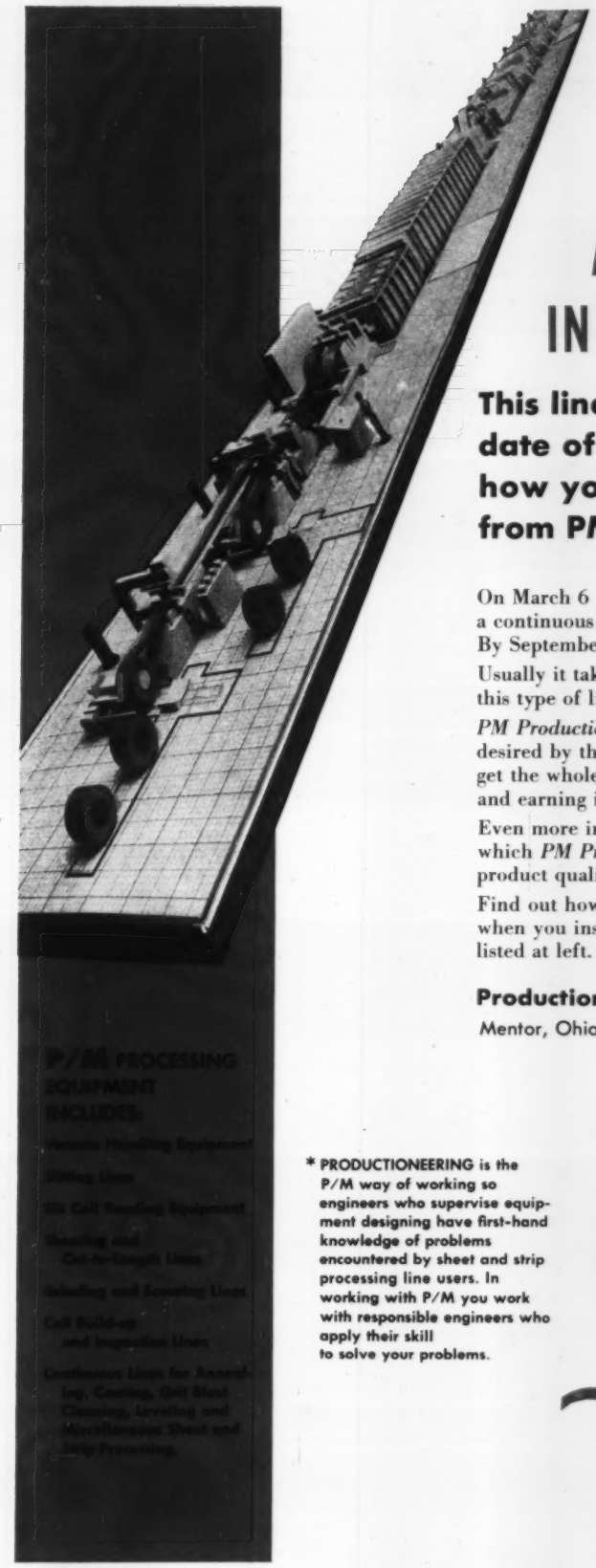
The silver price took a series of upward jumps in January, bouncing back from the post-Christmas doldrums (see chart). The stimulus: Steady demand at a time when less metal was becoming available, coupled with the reluctance of producers to sell any lower.

Look for greater stability in February. There's a better supply picture now and less pressure for the price to advance.

NONFERROUS PRICE RECORD

	Price Feb. 4	Last Change	Previous Price	Jan. Avg	Dec., 1958 Avg	Feb., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	30.00	Feb. 3, 1959	29.00–30.00	29.212	28.856	24.298
Lead	11.80	Jan. 21, 1959	12.80	12.415	12.800	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	101.625	Feb. 4, 1959	101.25	99.409	99.019	93.818
Zinc	11.50	Nov. 7, 1958	11.00	11.500	11.500	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



P/M PROCESSING EQUIPMENT INCLUDES:

Strip Handling Equipment

Slitting Lines

Slit Coil Handling Equipment

Shearing and Cut-to-Length Lines

Grinding and Scouring Lines

Coil Build-up and Inspection Lines

Continuous Lines for Annealing, Coating, Grit Blast Cleaning, Leveling and Miscellaneous Sheet and Strip Processing.

A NEW PICKLE LINE IN ONLY 6½ MONTHS?

This line delivered in 202 days from date of order . . . another example of how you get what you need from PM PRODUCTIONEERING*

On March 6 Production Machinery received an order for a continuous pickle line to be installed in an Ohio steel mill. By September 23 the order was shipped complete.

Usually it takes 12 months or more to deliver this type of line.

*PM Productioneering** hit this time target because *speed* was desired by the mill — quick completion would help get the whole 11 million dollar cold strip mill into operation, and earning its keep.

Even more important to the mill were engineering advances which *PM Productioneering* offered — improved product quality, increased production, and reduced maintenance.

Find out how *PM Productioneering* can offer you advantages, when you install any of the equipment listed at left. Call in a PM man — there's no obligation.

Production Machinery Corporation
Mentor, Ohio

*** PRODUCTIONEERING is the P/M way of working so engineers who supervise equipment designing have first-hand knowledge of problems encountered by sheet and strip processing line users. In working with P/M you work with responsible engineers who apply their skill to solve your problems.**

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Copper: Electrolytic, 30.00 deld.; custom smelters, 30.00; lake, 30.00 deld.; fire refined, 29.75 deld.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 30.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $218-221 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $52-55 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.375 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y. spot, 101.625; prompt, 101.50.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 305, 32.25; No. 1 yellow, No. 405, 23.00; manganese bronze, No. 421, 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 35.35; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $6.90-14.35; sheared mill plate, $5.00-8.50; wire, $5.50-9.50; forging billets, $3.55-4.10; hot-rolled and forged bars, $4.25-5.40.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H. R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	
0.136-0.096	43.20-48.30	
0.126-0.103		39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	
0.077-0.061		39.50-40.70
0.068-0.061	44.30-52.20	
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 23.50-24.50; No. 2 heavy copper and wire, 21.50-22.50; light copper, 19.25-19.75; No. 1 composition red brass, 17.50-18.00; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	54.13b	51.36c	....	54.32
Yellow Brass	47.40	31.99d	47.94	50.81
Low Brass, 80%	50.13	50.07	50.67	53.44
Red Brass, 85%	51.09	51.03	51.63	54.40
Com. Bronze, 90%	52.60	52.54	53.14	55.66
Manganese Bronze	55.82	49.42	59.92	....
Muntz Metal	50.15	45.46	....	....
Naval Brass	52.08	45.89	58.64	54.49
Silicon Bronze	59.23	58.42	58.77	61.23
Nickel Silver, 10%	62.97	65.29	65.29	....
Phos. Bronze	73.82	74.32	74.32	....

SCRAP ALLOWANCES e (Based on copper at 30 00c)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	26.000	26.000	25.250
Yellow Brass	19.750	19.000	18.000
Low Brass, 80%	22.125	21.875	21.375
Red Brass, 85%	23.000	22.750	22.250
Com. Bronze, 90%	23.875	23.625	23.125
Manganese Bronze	18.375	18.125	17.625
Muntz Metal	18.625	18.375	17.825
Naval Brass	18.375	18.125	17.625
Silicon Bronze	25.500	25.250	24.500
Nickel Silver, 10%	24.625	24.375	12.312
Phos. Bronze	27.000	26.750	24.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.50-17.00; new brass clippings, 15.25-15.75; light brass, 11.50-12.50; heavy yellow brass, 12.50-13.00; new brass rod ends, 13.50-14.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.00-14.50; brass pipe, 14.25-14.75.

Lead: Heavy, 7.50-8.00; battery plates, 3.00-3.25; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.50-31.50; old sheets, 27.00-28.00; turnings, 22.00-23.00; rods, 30.00-31.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 3.50-3.75; new diecast scrap, 3.25-3.50; old diecast scrap, 2.00-2.25.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.25-6.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 15.00-15.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.50-15.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.00; mixed low copper clips, 13.00-13.50; mixed high copper clips, 12.00-12.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 26.00; No. 2 heavy copper and wire, 24.25; light copper, 22.00; refinery brass (60% copper) per dry copper content, 24.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.00; No. 2 heavy copper and wire, 24.25; light copper, 22.00; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIALS

(F.o.b shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 46.79; oval, 45.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 119.50; 200-499 lb, 118.00; 500-999 lb, 117.50; 1000 lb or more, 117.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.65; 2000-5900 lb, 13.65; 6000-11,900 lb, 13.40; 12,000-22,900 lb, 13.15; 23,000 lb or more, 11.90.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 79.10; 100-600 lb, 69.70; 700-1900 lb, 67.00; 20000-9900 lb, 65.10; 10,000 lb or more, 63.80.

Stannous Chloride (Anhydrous): 25 lb, 154.40; 100 lb, 149.50; 400 lb, 147.10; 800-19,900 lb, 106.20; 20,000 lb or more, 100.10.

Stannous Sulphate: Less than 50 lb, 139.60; 50 lb, 109.60; 100-1900 lb, 107.60; 2000 lb or more, 105.60.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 125*)

3,881,550 net tons, equal to 22.5 days' output. That compares with 2,963,062 tons equal to 14.4 days' production, on the like date in 1957.

Petrochemical Prices Cut

Prices on isophthalic and phthalic anhydride have been reduced by Oronite Chemical Co., San Francisco. Isophthalic (for surface coatings and plastic products) was cut from 22 cents to 15.2 cents a pound. Phthalic anhydride was reduced from 21 cents to 17 cents a pound.

Oronite, a subsidiary of Standard Oil Co. of California, is a major supplier of petrochemicals. It has production facilities in Richmond and El Segundo, Calif., and Oak Point, La.

Structural Shapes . . .

Structural Shape Prices, Page 114

Structural fabricators expect gradual quickening in activity as the spring building season approaches. Eastern shops are becoming more selective in estimating tonnage. Some are not competing for beam and stringer work because of the low prices. Most could handle more shopwork but are not going after many jobs because of the low prices quoted.

Structural mills are enjoying better business than they've had in months, but they still have surplus capacity. The pickup they've recently experienced is traced to stronger demand on carbuilding account. There has been some tightening in deliveries on wide flange sections, but, in general, standard shape deliveries range only two to four weeks.

Practically all New England structural shops are now accepting some bridge tonnage, but they're buying plain material only to cover firm contracts.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5850 tons, superstructure, Duluth-Superior interstate bridge, contract No. 1, project 1-35-3, St. Louis Bay Section, Wisconsin-Minnesota, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

1650 tons, superstructure, Duluth-Superior interstate bridge, contract 2, project 1-35-3, Howard's Pocket Section, Wisconsin-Minnesota, to Wisconsin Bridge & Iron Co., Milwaukee.

1200 tons, Puget Sound drydock No. 6, to Pacific Car & Foundry Co., Seattle; Manson Construction & Engineering Co., Seattle, and associates, general contractors.

500 tons, structurals and bars, propellent development facilities, Redstone Arsenal, Huntsville, Ala., to Wilkes Steel Co., Birmingham (structurals), and Virginia Steel Co., Birmingham (reinforcing); Daniels Construction Co., Birmingham, general contractor.

445 tons, grade M, medium tensile, General Stores Supply Office, Navy, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

6140 tons, tainter gates, Markland locks and dam, Ohio River; bids Mar. 10, tentative date, to the U. S. Engineer, Louisville.

1500 tons, exposition buildings, Portland, Oreg.; Hoffman Construction Co., Portland, low on the general contract.

650 tons, two 9-span composite WF beam bridges, two 3-span composite WF beam bridges, and one single-span WF beam bridge, contracts 1, 2, and 3, Middlesex,

STEEL MILL WORKS MANAGER

Bar Rolling and Fabricating Mill Eastern United States has opening for Works Manager.

Age 40-55

Address Box 732, STEEL

Penton Bldg., Cleveland 13, Ohio

BERRY BEARING COMPANY

Bearing Headquarters Since 1920

Phone: DAnube 6-6800

2633 S. Michigan Ave. • Chicago 16, Ill.

MACHINERY FOR SALE

2) 200-Ton HPM "Fastraverse" Draw Presses; type CU-2; complete. $12,500.00/each, both $24,000.00.

2) SWIFT Spot Welders; 75 KVA, model #12. $1500.00/each.

1) TAYLOR-WINFIELD Horizontal Seam Welder; 50 KVA. $2,250.00.

1) MOREY #4 Turret Lathe. $2,250.00.

1) New HPM 2500# Radial Pump; model #3120-185. $1,750.00.

Equipment 440 Volts, Like-New Condition, F.O.B. Birmingham, Loaded Common Carrier.

ALEX BORDERS, MACHINERY

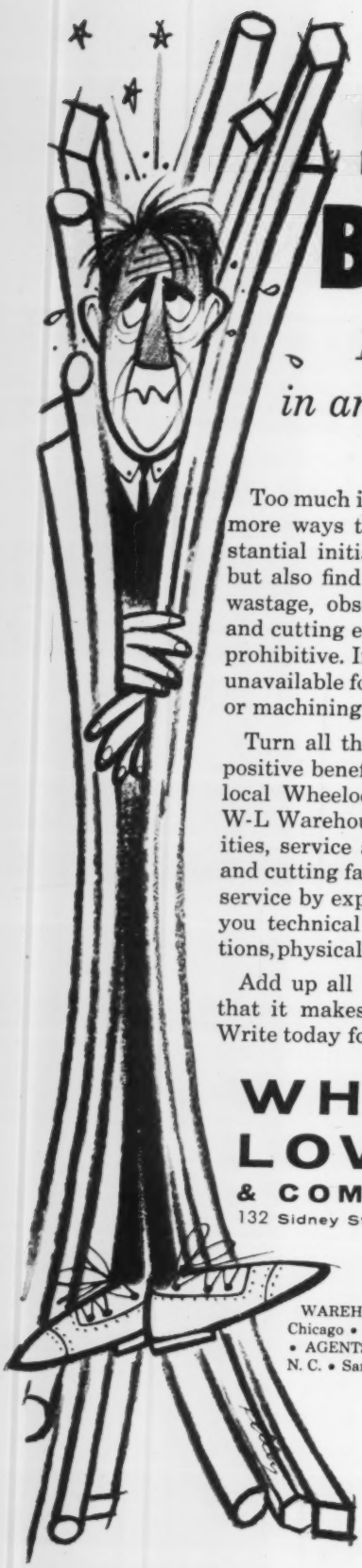
4305 Morris Avenue Birmingham 12, Ala.

Telephone: LYric 2-6902

CLASSIFIED

Positions Wanted

REGISTERED STRUCTURAL ENGINEER EXPERIENCED IN MODERN STEEL MILL FOUNDATION DESIGN, DESIGN COORDINATION AND ESTIMATION, DESIRES RESPONSIBLE POSITION OR DESIGN AND DETAIL WORK ON CONTRACT BASIS. REPLY BOX NO. 733, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.



STEEL BUYERS

Don't get caught in an Inventory Squeeze!

Too much inventory can really jam you up, in more ways than one. You not only incur substantial initial costs that tie up your capital, but also find that the costs piled up by scrap, wastage, obsolescence, maintenance, handling and cutting equipment, taxes and insurance are prohibitive. In addition, valuable floor space is unavailable for other uses, such as heat-treating or machining operations.

Turn all this around, and you see the many positive benefits made available to you by your local Wheelock-Lovejoy Steel Service Center. W-L Warehouse Service offers complete facilities, service and stocks . . . complete handling and cutting facilities . . . fast delivery . . . personal service by expert W-L metallurgists who'll give you technical information on grades, applications, physical properties, tests, heat treating, etc.

Add up all the advantages, and you'll agree that it makes good sense to deal with W-L. Write today for Wheelock-Lovejoy Data Sheets.

WHEELOCK, LOVEJOY & COMPANY, INC.
132 Sidney St., Cambridge 39, Mass.

AMERICAN STEEL WAREHOUSE ASS'N

WAREHOUSE SERVICE – Cambridge • Cleveland • Chicago • Hillside, N. J. • Detroit • Buffalo • Cincinnati • AGENTS – Southern Engineering Company, Charlotte, N. C. • Sanderson-Newbould, Ltd., Montreal & Toronto.

Vt.; bids Mar. 6, Montpelier, Vt.; estimates also on each contract separately; concrete reinforcing bar requirements, 380 tons.

400 tons, four-span rolled beam composite bridge, East Hartford, Conn.; White Oak Excavators Inc., Plainville, Conn., low on the general contract; also 345 tons, steel piles and 85 tons of reinforcing bars.

130 tons, also 35 tons of reinforcing, Washington State, two slab bridges, Grant Co.; bids to Olympia, Wash., Feb. 17.

Unstated, $1.7 million addition to Olympia Brewing Co.'s brewhouse, Tumwater, Wash.; bids soon; Wohleb & Wohleb, Olympia, engineer.

Unstated, 50-bed hospital, Kotzebue, Alaska; Chris Berg Inc., Seattle, low bidder to the Bureau of Indian Affairs.

REINFORCING BARS . . .

REINFORCING BARS PLACED

298 tons, road crossing, King County, Washington State, to Bethlehem Pacific Coast Steel Corp., Seattle; Scarsella Construction Co., Seattle, general contractor.

155 tons, bridge, King County, Washington State, to James D. English Steel Co., Tacoma, Wash.; Dale M. Madden, Seattle, general contractor, low at $230,132.

REINFORCING BARS PENDING

3650 tons, Markland locks and dam, Ohio River; tentative bid date Mar. 10, U. S. Engineer, Louisville, Ky.

180 tons, highway projects, Douglas and Josephine Counties, Oregon; general contracts placed.

85 tons, highway bridge, Pierce County, Washington State; bids to Olympia, Wash., Feb. 17.

PLATES . . .

PLATES PLACED

415 tons, high tensile hull plates, Puget Sound naval shipyard, Bremerton, Wash., to Wickwire Spencer Div., Colorado Fuel & Iron Corp., Wilmington, Del.

200 tons, including shapes, two freight barges, to Todd Shipyards Corp., Seattle; by Foss Launch & Tug Co., Seattle.

175 tons, medium tensile grade M, carbon hull plates, General Stores Supply Office, Navy, Philadelphia, to Kaiser Steel Corp., New York.

PLATES PENDING

477 tons, surplus sheet steel piling, Rocky Reach project, Washington State; purchase bids invited Feb. 27 by Chelan County P.U.D. No. 1, Wenatchee, Wash.

135 tons, 3/16 by 96 by 343 in., hot-rolled carbon, U. S. Coast Guard yard, Curtis Bay, Baltimore; bids Feb. 23.

100 tons, steel water storage tank, Manzano Base, New Mexico; bids Mar. 5, U. S. Engineer, Albuquerque, N. Mex.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 6 and 8 in. water pipe, Everett, Wash., to U. S. Pipe & Foundry Co., Seattle; also, 48 tons 3 in., to the Pacific States Cast Iron Pipe Co., Seattle.

210 tons, 6 to 12 in., for Tacoma, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

300 tons or more, 4 to 8 in.; bids to Silver Lake Water District, Seattle, Feb. 9.

RAILS, CARS . . .

LOCOMOTIVES PLACED

New York Central, 1000 seventy-ton self-clearing hopper cars, to its Despatch Shops, East Rochester, N. Y. These are in addition to 500 cars of similar type recently placed with the same shops by the Pittsburgh & Lake Erie, a subsidiary of New York Central. Expenditures for both lots will total around $13 million.

Detroit, Toledo & Ironton, 200 seventy ton, three pocket, open top hoppercars, to Greenville Steel Car Co., Greenville, Pa.

Advertising Index

Amchem Products, Inc. 62
American Brass Co., The 99
American Nickeloid Co. 10
American Welding & Mfg. Co., The 36
Anaconda Aluminum Co. 22
Arcos Corporation 110, 111

Berry Bearing Co. 131
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. 13
Blaw-Knox Co., Blaw-Knox Equipment Division 123
Bliss, E. W., Co. ..... Inside Back Cover
Borg-Warner Corporation, Ingersoll Steel Division 73
Buffalo Forge Co. 33

Cadman, A. W., Mfg. Co. 121
Central Foundry Division, General Motors Corporation 60, 61
Chambersburg Engineering Co. 102
Cincinnati Lathe & Tool Co. 23
Cincinnati Milling Machine Co., The, Milling Machine Division 57
Cincinnati Shaper Co., The 24
Coffing Hoist Division of Duff-Norton Co. .. 29
Colorado Fuel & Iron Corporation, The 25
Copperweld Steel Co., Aristoloy Steel Division 65
Crucible Steel Company of America 35

Detroit Steel Corporation 42
DoAll Co., The 124
Drop Forging Association 134
Duff-Norton Co., Coffing Hoist Division 29

Electric Controller & Mfg. Co., The, A Division of The Square D Co. 96
Erie Foundry Co. 7
Euclid Crane & Hoist Co., The 121

Farquhar, A. B., Division, The Oliver Corporation 68
Farval Corporation, The 44
Firth Sterling, Inc. 75

General Motors Corporation, Central Foundry Division 60, 61
Gisholt Machine Co. 28
Great Lakes Steel Corporation 14, 15

Heald Machine Co., The .... Inside Front Cover
Hill Acme Co., The, Hill Division 34
Hubbell, Harvey, Inc. 69

Illinois Clay Products Co. 19
Industrial Brownhoist Corporation 91
Ingersoll-Rand 58
Ingersoll Steel Division, Borg-Warner Corporation 73
Inland Steel Co. 93

Jones & Laughlin Steel Corporation, Stainless & Strip Division 106

Kearney & Trecker 66
Kinnear Mfg. Co., The 103

Lamson & Sessions 2
LeBlond, R. K., Machine Tool Co., The 4
Linde Co., A Division of Union Carbide Corporation 18
Lodge & Shipley Co., The 78

McLouth Steel Corporation 101
Malleable Castings Council 26, 27
Milford Rivet & Machine Co., The 16
Minneapolis-Honeywell Regulator Co. 119

National Steel Corporation 14, 15
Norton Co. 89

Ohio Crankshaft Co., The 3
Oliver Corporation, The, A. B. Farquhar Division 68

Pannier Corporation, The 121
Pittsburgh Steel Co. 30, 31
Production Machinery Corporation 129

Republic Steel Corporation 20, 21
Robbins & Myers, Inc., Hoist & Crane Division 127
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 25
Rogers Brothers Corporation 123
Ryerson, Joseph T., & Son, Inc. 41

Sheraton Hotels 11
Sintercast Corporation of America 12
Square D Co., The, The Electric Controller & Mfg. Co. Division 96
Starrett, L. S., Co., The 32
Sun Oil Co., Industrial Products Department .. 9

Texas Co., The 70
Timken Roller Bearing Co., The, Steel & Tube Division ..... Back Cover

Union Carbide Corporation, Linde Division .. 18
United States Rubber Co., Mechanical Goods Division 87
Universal-Cyclops Steel Corporation 105

Washburn Wire Co. 8
Wheelock, Lovejoy & Co., Inc. 132
Wysong & Miles Co. 17

Yoder Co., The 6

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 131

TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

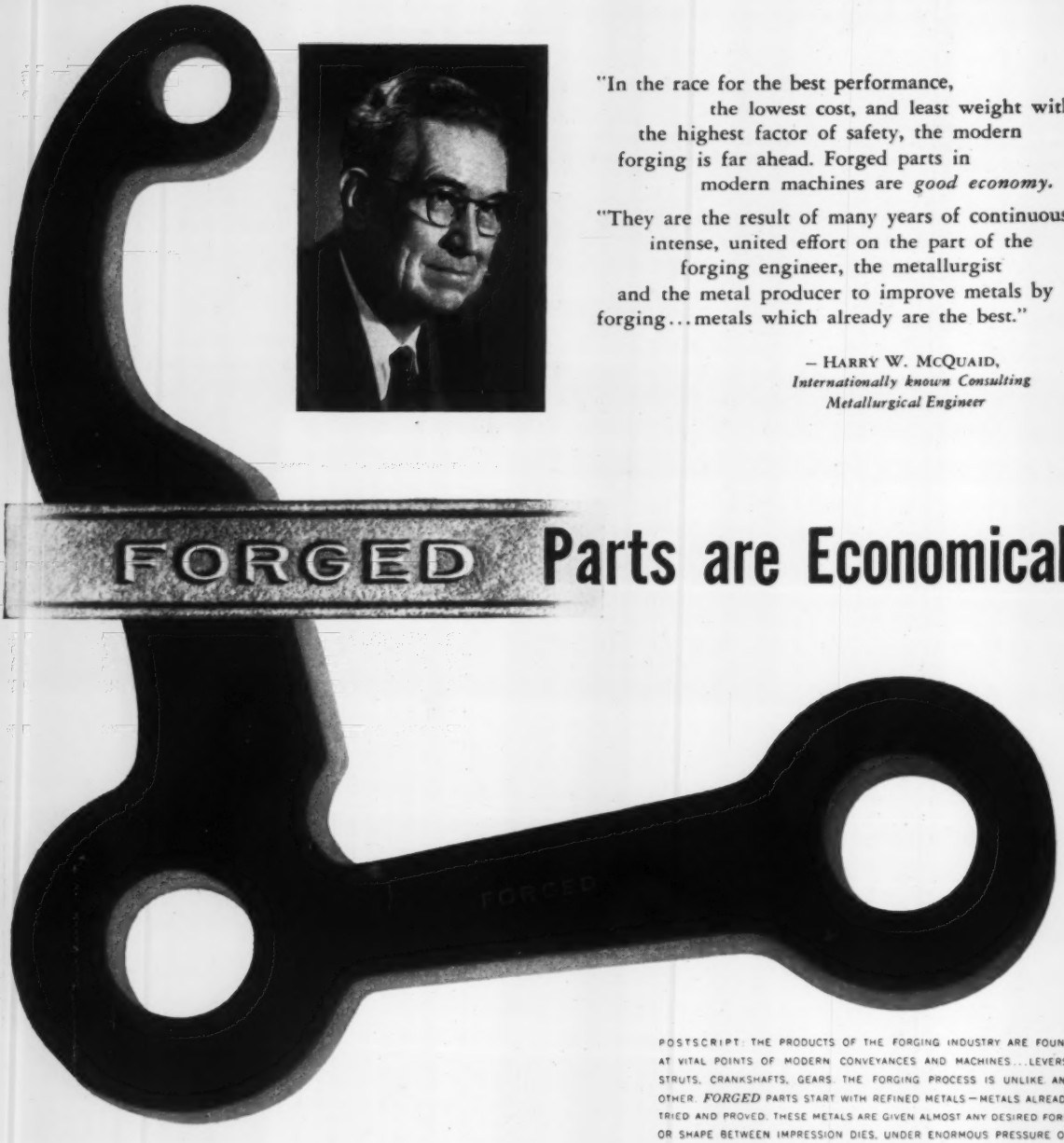
STEEL
The Metalworking Weekly

"In the race for the best performance, the lowest cost, and least weight with the highest factor of safety, the modern forging is far ahead. Forged parts in modern machines are *good economy.*

"They are the result of many years of continuous, intense, united effort on the part of the forging engineer, the metallurgist and the metal producer to improve metals by forging... metals which already are the best."

— HARRY W. MCQUAID,
Internationally known Consulting Metallurgical Engineer

FORGED Parts are Economical



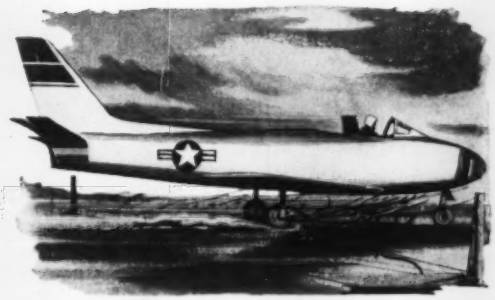
POSTSCRIPT: THE PRODUCTS OF THE FORGING INDUSTRY ARE FOUND AT VITAL POINTS OF MODERN CONVEYANCES AND MACHINES... LEVERS, STRUTS, CRANKSHAFTS, GEARS. THE FORGING PROCESS IS UNLIKE ANY OTHER. *FORGED* PARTS START WITH REFINED METALS — METALS ALREADY TRIED AND PROVED. THESE METALS ARE GIVEN ALMOST ANY DESIRED FORM OR SHAPE BETWEEN IMPRESSION DIES, UNDER ENORMOUS PRESSURE OR BY CONSECUTIVE BLOWS FROM POWERFUL HAMMERS. THE RESULT IS ADDED STRENGTH AND TOUGHNESS... WHICH PERMITS WEIGHT-SAVING DESIGNS, CUTS SERVICE COSTS, HELPS PROVIDE SAFETY IN A HIGH-SPEED WORLD.

DROP FORGING ASSOCIATION 55 Public Square • Cleveland 13, Ohio

MEMBERS: THE ALLIANCE DROP FORGING CO. • AMFORGE DIVISION, AMERICAN BRAKE SHOE COMPANY • THE ASHTABULA BOW SOCKET CO. • THE ATWATER MFG. CO. • BALDT ANCHOR, CHAIN & FORGE DIVISION, THE BOSTON METALS COMPANY • THE BILLINGS & SPENCER CO. • BONNEY FORGE & TOOL WORKS • THE BREWER-TITCHENER CORP. • THE BRODERICK CO. • BUCHANAN STEEL PRODUCTS CORP. • CALIFORNIA DROP FORGE CO. • THE CANTON DROP FORGING & MFG. CO. • CAPE ANN TOOL CO. • THE E. D. CLAPP MFG. CO. • CLIFFORD-JACOBS FORGING CO. • COLUMBUS BOLT & FORGING CO. • THE COLUMBUS FORGE & IRON CO. • COLUMBUS IRON WORKS CO. • COMMERCIAL SHEARING & STAMPING, INC. • CORNELL FORGE CO. • DOMINION FORGE LIMITED • THE DROP DIES & FORGINGS CO. • DUFF-NORTON CO. • ENDICOTT FORGING & MANUFACTURING COMPANY, INC. • ENGLUND FORGE COMPANY • FEDERAL DROP FORGE COMPANY • A. FINKL & SONS COMPANY • FORGINGS & STAMPINGS, INC. • GENERAL METALS CORPORATION • GIANT GRIP MFG. CO. • THE HARRIS-THOMAS DROP FORGE CO. • H. E. HOLBROOK DROP FORGE, INC. • HURON FORGE & MACHINE CO. • INDIANA FORGE & MACHINE CO. • INDIANAPOLIS DROP FORGING CO., INC. • INTERSTATE DROP FORGE CO. • JOOST MANUFACTURING CO. • KEYSTONE FORGING CO. • KORTICK MANUFACTURING CO. • KRAEUTER & COMPANY, INC. • KROPP FORGE CO. • LADISH CO. • LAKEVIEW FORGE CO. • THE THOMAS LAUGHLIN DIVISION, AMERICAN HOIST & DERRICK CO. • LEBUS MANUFACTURING CO. • MERRILL BROTHERS • MICHIGAN FORGING CO. • MILWAUKEE FORGE & MACHINE CO. • MODERN DROP FORGE CO. • MOLINE FORGE, INC. • MONDIE FORGE CO., INC. • MOORE DROP FORGING CO. • OCTIGAN FORGE DIVISION, H & B AMERICAN MACHINE COMPANY, INC. • PENNSYLVANIA FORGE CO. • PETTIBONE-MULLIKEN CORP. • PHOENIX MANUFACTURING CO. • PITTSBURGH FORGINGS CO. • POOR & COMPANY, CANTON FORGE & AXLE WORKS • H. K. PORTER COMPANY, INC., CLEVELAND DIVISION • PORTER FORGE & FURNACE, INC. • PORTLAND FORGE & FOUNDRY CO. • THE PROTO TOOL COMPANY • THE QUEEN CITY FORGING CO. • RHODE ISLAND TOOL CO. • ROCKFORD DROP FORGE CO. • STANDARD FORGINGS CORPORATION • THE STEEL IMPROVEMENT & FORGE CO. • STORMS DROP FORGING CO. • TAYLOR FORGE & PIPE WORKS • TRANSUE & WILLIAMS STEEL FORGING CORP. • TRINITY FORGE, INC. • UNION FORGING CO. • UNIT DROP FORGE, DIVISION OF FULLER MFG. CO. • WALKER FORGE, INC. • WALLACE FORGING, DIE & TOOL CO. • WARREN TOOL CORP. • WEBB FORGING COMPANY • WILCOX-CRITTENDEN DIVISION, NORTH & JUDD MFG. CO. • WILCOX FORGING CORP. • WILDE TOOL CO., INC. • J. H. WILLIAMS & COMPANY • WYMAN-GORDON COMPANY.

1958

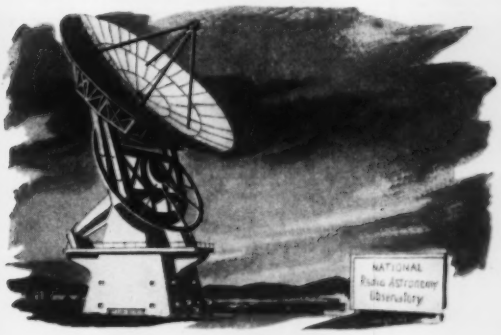
JUNE 19



STOPS SPEEDING JETS

Pilot rams F-80 into Bliss over-run barrier in successful test of installation at Air National Guard Field, Van Nuys, Calif. Bliss conceived, built, tested and installed this barrier and is working on other military and commercial applications.

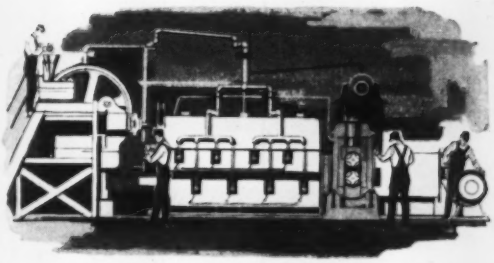
AUGUST 21



SCANS OUTER SPACE

National Science Foundation awards Bliss complete "turn-key" responsibility for building world's most powerful radio telescope at Green Bank, West Virginia.

SEPTEMBER 5



CONVERTS POWDER TO STRIP

Pilot plant results on Bliss-Chemetals process of rolling high quality strip direct from metal powder show important economies. Commercial use of process is imminent.

WHAT'S NEXT?

No matter what your "big idea", Bliss can build it...

If it involves precise machinery or fabrications...of any size...you'd be wise to take a look at Bliss. For in Bliss you'll find a most unusual combination of capacity, facilities and abilities. A combination that may provide the key to your metalworking problem—whether you need a single weldment or fabrication... a one-of-a-kind machine...or an entire turn-key plant.

BLISS

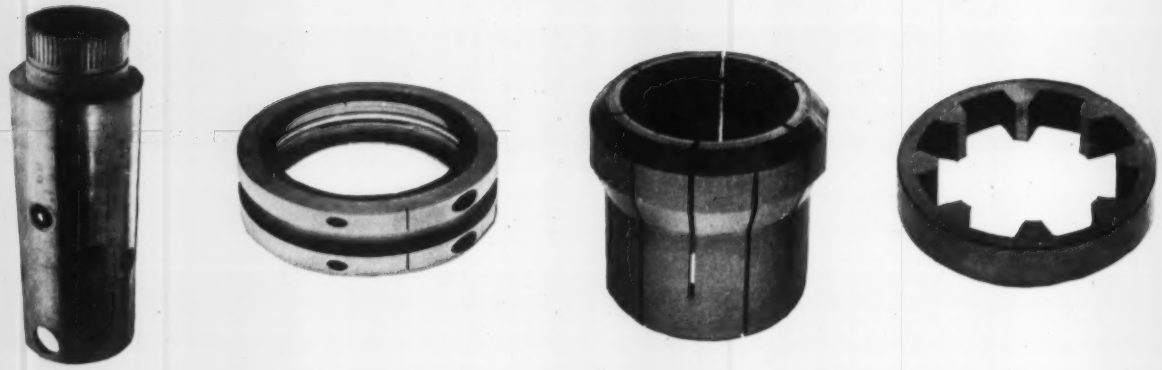
SINCE 1857

BLISS is more than a name... it's a guarantee

E. W. BLISS COMPANY · Canton, Ohio

52100

HARD, TOUGH, EASY TO MACHINE FOR TRICKY SHAPES



WORKHORSE parts like those pictured above have to be tough and hard for the jobs they do. But their intricate shapes demand a steel that's easy to work.

Timken 52100 steel meets every specification for this kind of flexibility. It's a high-carbon alloy steel with high fatigue and tensile strength plus good hardenability throughout its cross section. It machines easily, yet the steel's fully spheroidized structure retains full strength and hardenability.

Working pressures up to 200,000 p.s.i. are easily withstood by Timken 52100 steel. It will oil quench to a maximum hardness of 65/66 Rockwell C in normal sections.

Uniformity from shipment to shipment is assured, too, because high Timken Company standards control quality from melt shop to final inspection.

Timken pioneered 52100 tubing in America. Today, as the only U.S. source for 52100 steel in tubing, bar and wire, we continue as one of the world's largest producers of this versatile alloy.

And for small runs or emergency requirements, we maintain a mill stock of 52100 tubing in 101 sizes from 1″ to 10½″ O.D. Write today for a complete stock list of available sizes, grades and finishes. The Timken Roller Bearing Co., Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

TIMKEN® *Fine Alloy* STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING